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Advancing Sustainability at ESF

A Selected Topics Self -Study for MSCHE Reaccreditation

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President

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College of Environmental Science and Forestry

ESF's Mission

The mission of the College of Environmental Science and Forestry is to advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments.

ESF's Principles of Sustainability

We begin with a commitment to meet present needs without compromising the ability of future generations to meet their own needs. To do this we must:

- Understand basic functions of natural and social systems;
- Acknowledge and quantify the limitations of nature's capacity; and
- Develop solutions through the integration of social, economic, technological, and environmental systems.

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INTRODUCTION

Chapter 1. Executive Summary

It is most appropriate that, in our Centennial year, the State University of New York College of Environmental Science and Forestry (SUNY-ESF) undertake a thorough review of our remarkable institution and of its compliance with the Accreditation Standards of the Middle States Commission on Higher Education (MSCHE). It is also timely to conduct a Self-Study focused on the College's responsibility to adopt sustainable practices, teach the basic principles underlining the concept of sustainability, and conduct research to provide the foundation for sustainable management. The centrality of sustainability to the College's mission and the evolving understanding of its many dimensions have prompted SUNY-ESF to undertake a full-scale evaluation of its commitment to sustainability. The review took place within the process of preparing this Selected Topic Self-Study for reaccreditation and this document contains the results of the analysis and recommendations for how to move forward. The College has provided a demonstration of compliance with all 14 standards of excellence in higher education in the form of a document roadmap following the MSCHE format. The document roadmap includes citations to the necessary documentation of ESF's compliance.

This report is organized into three sections, the first of which provides a broad introduction to the College. The second section presents a general context for understanding SUNY-ESF's sustainability agenda by describing the institutional challenges and current progress in advancing the 2003 strategic plan, *Vision 2020*. The final section provides an analysis of sustainability at SUNY-ESF and offers a set of recommendations to advance the College's efforts going forward.

History of ESF

SUNY-ESF was founded in 1911 for the purpose of providing the education and research needed to stabilize and increase the forestry resources of the State. In the late 1800's, the forest resources of New York State had declined to 6.5 million acres. After 100 years of teaching, demonstrating and conducting supportive research, the forests of New York State have expanded to 18.5 million acres, and they are generating three times the forest biomass being consumed.

The objectives of the College have since evolved to include research and education related to solving a wide range of environmental problems, while taking into consideration human and economic implications as well as scientific understanding. Sustainable practices have been embedded within the College from the beginning. Over the last one hundred years, the mission has expanded to address sustainable practices in other areas including water resources, community planning and design, ecosystem management, and construction.

ESF Today

SUNY-ESF is a doctoral granting campus within the 64 campus system of the State University of New York. Governance of SUNY-ESF is unique in that it is guided by both a Governor-appointed College Board of Trustees and the Chancellor of the System who in turn reports to the Governor-appointed Board of Trustees of the State University of New York. The College is comprised of approximately 2,750 undergraduate and graduate students. Approximately 94 percent of the 135 full-time faculty are actively engaged in funded research. SUNY-ESF is designated a Doctoral/Research University within the Carnegie Classification framework. The College offers 22 undergraduate and 30 graduate degree programs, most of which are in the science, technology, engineering, and math (STEM) fields. *US News & World Report* ranks ESF among the "Top 50 Public National Universities" and is in the top 50 of all national universities in the "Best Values" category. *Forbes* ranks ESF the third best college in the nation for women in science and engineering. The campus culture is influenced by a strong commitment to protecting the environment and a long-standing partnership with adjoining Syracuse University which provides ESF students with expanded academic and extracurricular opportunities.

Strategic Planning

As part of the Self-Study process, the College fully reviewed its progress in complying with *Vision 2020*, our strategic planning document. This guiding document declares SUNY-ESF's commitment to stand as a model of environmental sustainability. Approximately 80% of the activities outlined in the far-reaching plan have

been initiated or completed. Since *Vision 2020*'s 2003 inception, the College has successfully followed its seven strategic planning goals and enhanced its undergraduate and graduate academic excellence, student experience, visible reputation, financial stability, partnerships, responds to the needs of society and the human resource and physical infrastructure of the College.

The review of our strategic plan finds that SUNY-ESF offers two top five undergraduate programs, a top ten undergraduate program, and one top five graduate program. In addition, the College has introduced two new associate and two bachelor programs. Financial aid for students has increased by more than 47% since FY 2003-04, due in part to an increase of approximately 30% in undergraduate student costs, a 29% increase in ESF's number of full-time undergraduate students enrolled (1,209 to 1,558), and a 100% increase in undergraduates enrolling from outside New York State (128 to 256) with higher tuition costs.

We have enhanced campus safety through security measures, policies and communication systems. To broaden experiences in the global ecosystem we have worked to develop student international opportunities. Here at home, community service has been substantially enhanced with approximately 65,000 hours provided on an annual basis. ESF was recognized by The Presidents Higher Education Community Service 2010 Honor Roll.

Through the strategic plan, the campus embarked on initiatives including successfully enhancing the College's visibility and developing partnerships to support financial stability and increasing community services. SUNY-ESF has worked to improve its public profile through cable television and direct mail campaigns, a social network presence, the establishment of an intercollegiate athletics program and our first official campus mascot (Oakie the Acorn), and the creation of a "Going Green" series of weekly television spots reaching 1.72 million people.

Over the past ten years, SUNY-ESF established private funding sources and diversified its endowment. Furthermore, academic, international, regional, topical and federal partnerships have been nurtured or developed with other SUNY and private institutions and organizations. Specific examples include a partnership with the U.S. Small Business Administration to stimulate the growth of urban businesses and a project with the Kauffman Foundation and Syracuse University, to infuse entrepreneurship into existing courses.

The College will be updating the strategic plan to conform with the newly developed State University of New York Strategic Plan ("The Power of SUNY") beginning the first quarter of 2012.

Sustainability at ESF

The *Vision 2020* strategic planning process developed a framework to provide a context for integrating sustainability into its academic, research and service programs. This process was later supported by the 2007 Periodic Review Report (PRR) for MSCHE which identifies specific opportunities for progress towards sustainability. Within this framework, the College has set three sustainability goals:

1. Enhance the student experience to produce graduates who use their knowledge to foster actions that lead to increasingly sustainable societies;
2. Grow the College research enterprise to foster sustainable societies; and
3. Champion sustainability through on-campus demonstration.

Since these goals were formally set, ESF has made commendable progress in the areas of education, research and demonstration.

Review of the sustainability initiatives on campus reveal an array of opportunities for students to learn about this topic. Faculty are heavily involved in sustainability research and have extensive academic backgrounds in sustainability. They have embraced the College's sustainability principles and have embedded them into existing coursework. For example, every undergraduate and graduate degree program contains at least one (and, in most cases, many) required courses that address ESF's Principles of Sustainability. The College also reorganized its undergraduate and graduate Environmental Science programs to encourage interdisciplinary learning. Furthermore, ESF now offers a new minor in Renewable Energy and a graduate program in Sustainable Energy Management. Student exposure to sustainable practices also takes place outside of the classroom

on admissions tours, new student orientation, student clubs, a campus garden, internships and campus activities. The campus culture of sustainability is augmented with news, publications and online resources specifically relating to sustainability. SUNY-ESF's outreach programs now focus on sustainability that engage community members ranging from the middle school students to practitioners, covering topics in sustainability in institutional planning, green entrepreneurship, and renewable energy.

The second goal seeks to expand the College's research efforts to include those that foster sustainable societies. An assessment of this goal revealed 74 of the 135 research-active faculty members specifically engaged in research related to sustainability. A review of 2009-10 departmental annual reports indicated all academic departments had at least one faculty member involved in sustainability research leading to 74 journal articles, 11 books and 17 other reports as well as 120 conference presentations. Additionally, in 2010-11, 30 sustainability-related projects (funded at $4,035,029) were in progress and an additional 47 project proposals (requesting a total of $23,704,101) were submitted. Commitment to faculty members and facilities has also grown. The College has invested in sustainability research facilities such as an aquatic research laboratory and a biofuels pilot plant, and eight new faculty members have been hired since 2005 to augment sustainability research.

The final sustainability goal seeks to advance the campus's visible sustainability initiatives through demonstration. SUNY-ESF aims to practice what it teaches. Initiated through *Vision 2020's* goal, "Investing in ESF's human resources and physical infrastructure," and expanded within the College's Climate Action Plan, *ESF Carbon Neutral by 2015*, we see a campus whose infrastructure has been transformed. Progress in this area includes new renewable energy technology installations, participation in national commitments to sustainability and top-down and ground-up initiatives. This Fall SUNY-ESF students moved into our new residence building, Centennial Hall, for which we will seek LEED Gold Certification in the coming months. Designed with a number of key energy efficiencies and technologies, the Gateway Building will create more energy than it consumes. The College will seek LEED Platinum Certification for this building scheduled to open in 2012. In 2007, SUNY signed the American College & University Presidents' Climate Commitment.

As part of the commitment the College completed two greenhouse gas inventories, a plan to reach net zero carbon emissions by 2015, and created the Campus Climate Change Committee. The Commitment has also inspired several new visible campus installations that seek to reduce energy. They include one of the country's first 250 kW molten carbonate fuel cells; a wind turbine; a biomass boiler; a green roof on Walters Hall; solar arrays on Baker Laboratory, Waters Hall, Moon Library and the Adirondack Ecological Center; alternative fuel fueling stations for campus and community vehicles; and a self-serve bicycle maintenance station. Other sustainability-related initiatives include the installation of below-ground storage to collect storm water from parking areas; a rain garden; porous pavement in three different areas of campus; and water-saving faucets.

The administration at SUNY-ESF established an Office of Renewable Energy Systems, with two full-time staff members to help focus our sustainability efforts. This office helped to develop a sustainability website; introduce car-sharing and ride-sharing programs; implement sustainability action plans within administrative offices; and adopt several sustainability policies that aim to reduce waste, reduce energy use, purchase more environmentally friendly products and enhance carpooling on campus. Students have also fueled a number of changes on campus. They established the biodiesel production system used to fuel maintenance equipment on campus; the de-lamping of two campus buildings; and an organic campus garden. SUNY-ESF has also received a grant from the Kauffman Foundation to study the feasibility of developing a green energy cooperative based on biodiesel production and established an integrated pest management plan, limiting the amount of pesticide use on campus and increasing the number and diversity of native plants.

In April of 2011, the College completed the Charter version of the Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability, Tracking Assessment & Rating System (STARS). As a result of all of the work faculty, staff, students and administrators have contributed to making the campus more sustainability, SUNY-ESF received a STARS Silver rating and plans to reach a Gold rating by 2014.

Challenges

The Self-Study also identified a number of institutional challenges requiring attention to maximize the College's potential to achieve the goals outlined in its strategic plan, including those related to sustainability. With input from the campus community, including the President's Cabinet, the Provost's Academic Council, the SUNY-ESF Board of Trustees, and the Self-Study Steering Committee, they have been consolidated into eleven broad areas of focus as follows.

Challenge 1: Obtaining adequate operational resources within a constrained environment

Challenge 2: Attracting and retaining quality, diverse faculty and staff within a constrained environment

Challenge 3: Rectifying inefficiencies created by an aging administrative infrastructure

Challenge 4: Establishing and defining the College's position/brand in a changing global arena

Challenge 5: Enhancing and institutionalizing assessment practices to help drive institutional objectives

Challenge 6: Meeting enrollment objectives in the face of new competitive programs within and outside SUNY

Challenge 7: Sustaining strong and vigorous Ph.D. programs that attract students, financially support their education and research and award degrees in a timely manner

Challenge 8: Achieving diversity goals within our student population

Challenge 9: Engaging effectively the campus community in understanding and addressing institutional goals

Challenge 10: Fitting ESF's strategic plan within the SUNY Strategic Planning Objectives to obtain benefits of System membership

Challenge 11: Maintaining effective relationships with Syracuse University and other partners

Recommendations

SUNY-ESF has developed several recommendations to address these challenges, including institutional recommendations focusing on financial resources and enhancing the efficiency of operations, developing a plan for recruiting under-represented minorities to the faculty and student populations, thoroughly assessing institutional technology needs, and continuing to work with faculty and staff to improve assessment initiatives. In response to the in-depth review of the campus' integration of sustainability efforts into its curriculum, research and operations, SUNY-ESF recognizes the very significant progress it has made in making the campus more sustainable, however we have identified several opportunities for further improvement in meeting our sustainability goals.

Institutional Recommendations

Advancing many of the institution's goals is dependent on acquiring additional financial resources. The associated recommendations are as follows:

- Continue to increase enrollment of out-of-state undergraduates through maintenance of strong national visibility and marketing initiatives.
- Increase enrollment of tuition-paying graduate students through the development of focused Master's Degree programs feeding strong employment markets.
- Build upon the success of the ESF Foundation's Centennial Campaign to enhance private giving by reinvesting Foundation proceeds to increase the size of the development staff.
- Increase sponsored research funding by focusing faculty hiring in fields having significant opportunities for extramural support (e.g. ESF's new initiatives in environmental health and renewable energy management), and through hands-on assistance from the Research Office in helping faculty identify appropriate funding opportunities.
- Increase indirect cost recovery from sponsored programs by focusing on grant opportunities that permit reasonable indirect charges, including federal agencies and some private organizations.

- Continue to develop the newly introduced summer program (2010), concentrating on distance-learning and short-term field experiences.
- Maintain strong visibility and value to SUNY to ensure System understanding of ESF's mission and the special challenges that derive from that mission.

Obtaining adequate financial resources to meet institutional goals also requires achieving greater operational efficiencies. Recommendations for achieving financial efficiency are as follows:

- Reduce energy costs by reducing energy dependence on high cost Syracuse University steam by installing high efficiency power plants in new ESF buildings, by adding solar panels and wind turbines where possible to ESF facilities, by acting on the recommendations of the recent New York Power Authority audit, by making energy efficiency a primary criterion in new building construction and in renovation projects, and by enacting new recommendations that will come from the recently formed ESF energy management team.
- Renegotiate the Accessory Instruction and Related Services Agreement with Syracuse University to include terms that meet the needs of both institutions.
- Work with Upstate Medical Center and other Central New York SUNY institutions to identify services that may be shared to reduce costs to all institutions.

Aside from recommendations specifically related to achieving financial flexibility, the following are recommended:

- Develop a new five-year academic plan to identify and address high priority areas for advancing the mission of the College.
- Continue to invest a portion of the salary savings from faculty retirements in merit raises to recognize and retain high performing faculty members.
- Develop an enhanced plan for adding under-represented populations to the faculty.
- Consider new ways to facilitate spousal hires, e.g. through active programs with nearby SUNY and private colleges and universities. The ESF-wide approach to the search and selection process seemed highly desirable and effective.
- Continue to provide formal grant proposal writing training on an annual or more frequent basis, and provide attractive travel opportunities for promising young scholars (or scholars entering new research areas) to attend targeted grant-development workshops.
- Thoroughly assess institutional information technology needs now and in the future, and develop and implement a plan that meets those needs.
- Improve the utilization of information systems through enhancement of ESF's database system and through training of ESF employees on data systems managed by supporting agencies including the SUNY Research Foundation, SUNY, and other state agencies.
- Include documentation and dissemination of policies, procedures and protocols as part of employee performance programs where appropriate.
- Continue to seek and secure strategic alliances with external partners, public and private, academic and non-academic to advance institutional goals and service to society.
- Maintain strong relations with Syracuse University. Seek additional opportunities for coordination and cooperation.
- Continue to incorporate assessment and improvement as routine operational practices.
- Maintain effective visibility efforts. They advance almost every aspect of the College's agenda.
- Take advantage of the new energy in Faculty Governance to facilitate campus-wide communication and to engage the faculty and staff in meaningful dialog to promote understanding and consensus on major College issues.

Sustainability Recommendations

Education

SUNY-ESF was established based on the principles of sustainability and protection of the environment, independent of the terms used to describe this concept over the past 100 years. An assessment of faculty, educational offerings and General Education requirements reveals that sustainability issues are well integrated into teaching, research, and service at ESF. However, changes in how the College collects and reports data are needed in order to simplify the collection of sustainability-related, campus-wide information for future assessments.

- ESF's principles of sustainability provide an important first step in assisting faculty members with defining the types of sustainability-related teaching, research, and service they do. Identifying sub-principles that clearly identify how each principle relates to each department would further clarify the meaning of the principles for faculty at ESF.
- As course descriptions are reviewed, sustainability-related concepts should be added as appropriate to improve assessment of sustainability courses. Designate courses with a "Sustainability Emphasis."
- Programs such as the GA Colloquium on Teaching and Learning are not intended to teach sustainability, per se, but a discussion of sustainable practices (e.g. the reduction of paper usage by converting to web-based distribution of materials) is included. In the future the College could include a 'special topics' session – as has been done with other selected topics - that is devoted to sustainability and sustainable practices on-campus.
- The new Centennial Residence Hall provides opportunities for increased integration of sustainability between the academic and extracurricular aspects of college life. The incorporation of sustainability into the activities and culture of the new residence hall will greatly enhance the educational opportunities of the students.
- Consider how study abroad experiences related to sustainability could be integrated into all academic programs.

Research

The following steps taken over the next 5-10 years will help the research enterprise at SUNY-ESF evolve toward a more competitive and globally recognized position, particularly in fields that comprise the multi-disciplinary portfolio of sustainability research. These initiatives will be vital to enhancing the SUNY-ESF footprint, both in recognition and in financial support.

- As was done with the Empire Innovation and High Needs programs, search for and hire sets of faculty to include biological and physical scientists, engineers, landscape architects and social scientists who will integrate our sustainability research and academic programs.
- Determine the potential research productivity and financial flexibility provided by a net gain of one or more new faculty per year over the next ten years.
- Increase emphasis and support of large, multi-institutional collaborative proposals. Although proposal numbers (260/year) and success rates (30% on proposals < $2.5 M are quite high, relatively few large and long-term proposals have been funded.
- Create incentive programs for Centers, Consortia and Institutes to develop collaborative, competitive research proposals, and continue to strive for formal partnerships with existing, private entities such as Upstate Freshwater Institute and the Onondaga Environmental Institute.
- Sponsor a college-wide retreat/event that highlights the Centers/Institutes/Consortia and brings state and national legislators to the College. Recognize a Center or Institute annually with a desirable and visible award.
- Work with private corporations, such as Honeywell, to further promote support of research and graduate programs, and with the ESF Development Office to create new modes of support for research, startup, and seed grants.

- Develop programs similar to the new Environmental Medicine/Hill collaboration, in which modest annual contributions by ESF, SU, UMU and the VA Hospital are used to stimulate teams to pitch collaborative proposals to major funding agencies such as National Institutes of Health.
- Develop additional venues for ESF faculty and staff to brainstorm together in looking to future research areas that are vital to global health and sustainability, and within the reach of College resources, vision and goals.
- Actively pursue ESF research connectivity with the SUNY system, which represents the fourth largest university system in the United States in research expenditures. New programs with Binghamton University in technology transfer and with Upstate Medical University in Environmental Medicine are current examples; additional opportunities exist to include SUNY Buffalo, Stony Brook and Albany. Research proposals that highlight the "Power of SUNY" are likely to receive enhanced attention from granting agencies.
- In the next version of the ESF Promotion and Tenure guidelines, add a "sustainability" parameter to the teaching, research or outreach responsibilities of each faculty member.
- Add a sustainability criterion to the annual Exemplary Researcher Award, or create a new award to include a seminar and recognition ceremony.
- Establish linkages between ESF's research programs and the AASHE STARS program to increase student and staff involvement with campus-wide sustainability issues (Sustainability Tracking, Assessment & Rating System is a program that measures and encourages sustainability in all aspects of higher education, see Chapter 4).
- To foster cross-campus awareness and collaboration in sustainability research, establish a Faculty seminar series and add a sustainability section to the student "Spotlight on Research" annual poster symposium.
- Use the existing Seed Grant programs to catalyze new research programs in sustainability.
- Through indirect funding and perhaps private development support, strengthen linkages with those groups in the US Forest Products Industry with responsibility for strategic visioning and sustainability initiatives. Maintain representation on USDOE, USDA, and Forest Service panels that establish and "roadmap" research priorities. Provide travel support and recognition for this activity.
- Work with the ESF Foundation to identify opportunities for funding specific research initiatives through the ongoing Centennial Campaign.

Demonstration

ESF is well-positioned to align its campus master plan and sustainability plans with the new SUNY Strategic Plan regarding energy issues and demonstration projects. We can also explore ways to bring greater focus to the sustainability efforts on campus to improve ESF's current practices of engaging internal and external constituencies with the following recommendations.

- Establish sustainability performance metrics based on the STARS rating system for members of the President's Cabinet.
- Clearly identify the Office of Sustainability
- Engage the campus in a discussion of environmental stewardship and sustainability to determine the need to change the College mission and vision.
- Continue to utilize State University Capital Funding, supplemented by grants from federal, state and local partners, to implement the bulk of the College's sustainability demonstration projects.
- Examine additional private/public partnerships as a way to finance sustainability projects and access potential tax benefits associated with renewable energy projects.
- Examine the development of a dedicated sustainability fund, based on a share of the economic savings realized from certain projects, to help develop a source of funds for environmentally beneficial demonstration projects.

- Engage in additional discussions with faculty and staff to determine how to find more opportunities to link existing and future research interests and sustainability projects.
- Review the sustainability communications efforts to internal and external audiences to determine where students and faculty can enhance the effort.
- Develop and publish a sustainability report.
- Review existing planning documents and develop future sustainability plans consistent with the new SUNY strategic plan.

SUNY-ESF has much to be proud of over its one hundred years and especially in the ten year window of the Middle States Review. Through the campus-wide process of conducting the Self-Study and reviewing the College's compliance with the 14 MSCHE standards of excellence in higher education, we have identified challenges to overcome while moving forward, and also a significant number of opportunities. Many initiatives have already been undertaken to adjust College operations and goals as a result of this Self-Study process.

Chapter 2. Certification Statement

CHE MSA **Middle States Commission on Higher Education**
3624 Market Street, Philadelphia, PA 19104-2680
Phone: 267-284-5000 Fax: 215-662-5501 www.msche.org

Certification Statement:
Compliance with MSCHE Requirements of Affiliation and Related Entities Policy
(For SUNY State-Operated Institutions Effective October 1, 2009)

An institution seeking **initial accreditation** or **reaffirmation of accreditation** must affirm that it meets or continues to meet established MSCHE requirements of affiliation and "Related Entities" policy.

This signed statement should be attached to the executive summary of the institution's self-study report.

SUNY College of Environmental Science and Forestry
(Name of Institution)

The State University of New York represents that this institution operates within the program of the SUNY System. The undersigned hereby certify that SUNY recognizes the Commission's compliance requirements for this institution and will uphold State University's policies pertaining to MSCHE standards and requirements of affiliation.

Cornelius B. Murphy Jr. — (Campus President) — April 13, 2011 — (Date)

(Chair, SUNY Board of Trustees) — 5.12.11 — (Date)

Chapter 3. Institutional Profile

ESF at a Glance

- Founded in 1911 as the New York State College of Forestry at Syracuse University, ESF is one of SUNY's oldest and most unique colleges.
- The ESF campus occupies 17 acres in Syracuse and 25,000 acres on its regional campuses throughout Central New York and the Adirondack Park.
- *Fall 2010 enrollment totaled 2,718 students representing 34 states and 35 countries (543 graduate students, 1,586 full-time and 587 part-time undergraduates).
- ESF has 135 full-time faculty members (professorial ranks, research associates, and tenure-track instructors) engaged in teaching, research and service. In addition,*60 visiting faculty members provide supplemental teaching services. Professor George Curry was selected as the 2008 New York Professor of the Year by the Carnegie Foundation.
- ESF alumni number approximately 19,000 worldwide.
- ESF offers 22 undergraduate and 30 graduate degree programs, including bachelors, masters and doctoral (Ph.D.) programs in the sciences, engineering and forestry, and a nationally ranked program in landscape architecture. Associate degrees in environmental conservation, forest technology and land surveying are offered at ESF's Ranger School in the Adirondacks.
- The College's long-standing partnership with Syracuse University provides ESF students with the opportunity to take classes at SU, use library, computing, recreation and health facilities, and join student clubs and organizations.
- **US News & World Report* ranks ESF 36th among the "Top 50 Public National Universities" and is #50 of all national universities in the "Best Values" category.
- *Forbes* ranks ESF the 3rd best college in the nation for women in science and engineering.
- ESF students contribute more than 70,000 hours of community service each year, and the College has been named to the President's Higher Education Community Service Honor Roll.
- Approximately 60 percent of ESF graduates work in the private sector, 20 percent for government, and 20 percent for non-profit agencies.
- ESF is among the leading institutions within the SUNY system in terms of annual research expenditures per capita: $108,585.71.
- Ninety-four percent of ESF faculty members actively engage in funded research.
- ESF is one of the most selective SUNY campuses for undergraduate admission, with a 44% acceptance rate for fall 2011.
- Approximately 20% of entering freshmen come from outside New York State (the third highest percentage in the SUNY system) and more than 10% come from minority populations.
- ESF students rank the College among the top 3 SUNY campuses for quality of education and general student satisfaction, and ESF is the top rated doctoral campus in a system-wide survey of SUNY students.
- According to ESF's 2008 National Survey of Student Engagement results, 42% of undergraduate seniors participated in a research project with a faculty member outside of course or program requirements; this is more than double the rate of participation in undergraduate research noted by SUNY sector peers or nationally within the Carnegie class.
- The six-year graduation rate for first-year freshmen entering in the fall of 2005 was 65 percent and is one of the highest rates in SUNY.

*2011 data not available at time of publication.

- Fall 2011 Entering Freshmen Profile:
  Acceptance Rate 47%
  Mean Verbal SAT- 588
  Mean Math SAT- 605
  Mean ACT- 26
  Mean High School Average- 92% on 100 scale
  Percent Women- 56%
  Percent Men- 44%
  Ranked in top 10% of High School - 37%
  Ranked in top 25% of High School - 73%
  Out of state students- 25%
  States represented- 24
  Foreign countries represented- 3

ESF's Mission

The mission of the College of Environmental Science and Forestry is to advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments.

ESF's Vision

With the beginning of President Murphy's tenure on campus, ESF embarked on a community wide participatory and strategic planning process, resulting in the publication of a document entitled "*Vision 2020*" in 2001 that was formally approved in 2003. The *Vision 2020* Strategic Plan outlines a collective vision for the growth and development of the College, revolving around the theme of "a better world through environmental discovery." Central to the vision, was the development of seven strategic goals tied to satisfying the mission of the college. These seven goals include:

GOAL 1: Enrich academic excellence in both undergraduate and graduate education

GOAL 2: Provide an outstanding student experience

GOAL 3: Be the "go-to" institution with a strong and visible reputation

GOAL 4: Become financially secure and independent

GOAL 5: Strategically build and enhance partnerships and collaborative relationships

GOAL 6: Respond to the needs of society

GOAL 7: Invest in ESF's human resources and physical infrastructure

Since its formulation in the "*Vision 2020*" statement, the College's strategic plan has been elaborated as well in a number of other key strategic documents, and the participatory planning processes that produced them. These include a campus combined site and program study (2008), a campus sustainability plan (2010), and a college-level Climate Action Plan (2010). Currently, ESF is engaged in helping the State University Construction Fund (SUCF) develop a Campus Master Plan for all physical facilities. ESF's vision for meeting environmental challenges frames the context of its educational mission. The college educates and trains undergraduate and graduate students as the next generation of environmental thinkers, decision makers and problem solvers.

Today's environmental issues are inherently complex and must consider a variety of perspectives and competing interests. Four themes — Applied Ecology and Conservation Biology; Renewable Materials, Energy and Biotechnology; Sustainable Systems and Communities; and Environmental and Natural Resources Information Systems — will provide a context to integrate and synthesize the cultural, natural and industrial perspectives embracing all of ESF's academic, research and service programs.

Within this framework, ESF's academic programs bring a multidisciplinary and collaborative approach that builds on past strengths and forges new ones. ESF's dynamic array of programs, with a foundation of academic excellence, offers solutions to the world's environmental problems.

Applied Ecology and Conservation Biology

The field of Applied Ecology and Conservation Biology explores how to maintain healthy, functional ecosystems and conserve the earth's rich biological diversity. Its purpose is to identify long-term measures to prevent degradation of ecosystem function and loss of biological diversity while accommodating the ever-increasing needs of human society.

Conservation biology applies scientific knowledge to maintaining and restoring the Earth's biological diversity. Conserving diversity at all levels of an ecosystem is both paramount and increasingly difficult. Conservation biology integrates biological perspectives with social, economic, and political views in order to maintain this delicate balance.

Renewable Materials, Energy and Biotechnology

The wise use of renewable materials is integral to both economic and environmental well-being. Developing strategies to reduce reliance on fossil fuels as an energy source is a vital challenge for the 21st century. Applied Biotechnology involves using organisms and renewable carbon (trees, switch grass, etc.) to improve the human condition. It is essential to achieving environmental improvement because it creates new ways to use natural processes for human benefit and can be directed to cleanse contaminated habitats.

Sustainable Systems and Communities

The concept of sustainable development was defined by the World Commission on Environment and Development as a form of progress "that meets the needs of the present without compromising the ability of future generations to meet their own needs." At ESF, successful design and implementation of sustainable systems and communities integrate concerns for the natural environment with concerns for quality of human life and communities. Through research and education, college faculty and students explore the interactions of biological and human systems for the maintenance and long-term improvement of both.

Environmental and Natural Resources Information Systems

Scientific discovery begins with curiosity and a question that needs to be answered. From there one collects objective data and then uses or analyzes that information. Finally, the outcome or result of that sequence is concluded and communicated. Through data acquisition, analysis, modeling and simulation, and interpretation, ESF brings environmental and natural resources information systems to the classroom as well as to research and public service efforts. Examples include wildlife monitoring, ecosystems and watershed modeling, GIS and remote sensing analysis, urban lead and acid rain studies and the Northern Forests Initiative.

These four themes focus ESF's academic programs to help create an effective, dynamic and diverse workforce of scientists, engineers, planners, designers, policy makers and teachers. Using analytical, communication and technical skills honed at ESF, these professionals work comfortably in an interdisciplinary setting, understanding the links between human activities and environmental impacts. Our graduates are citizens who anticipate the consequences of these activities, articulate those consequences to society, and promote behaviors and actions that result in sustainable environmental systems from the local to the planetary levels.

ESF's Values

The College of Environmental Science and Forestry embraces the public trust placed in it by the people of New York State and accepts the responsibility to advance knowledge in the College's specialized areas of study. ESF will fulfill this duty consistent with the core values of discovery, community and service.

As an academic institution, ESF is committed to the process of discovery, the dissemination of knowledge and the discipline required of scholarship. Embedded in these values are innovation and a dedication to continuous learning. Informed by science and guided by effective design and planning, the faculty, staff and students at ESF are committed to sustainable practices and policy alternatives that will both protect the environment and meet the needs of a global society.

As a community, ESF is committed to the highest standards of personal and professional behavior. The College celebrates the diverse backgrounds, cultures and perspectives represented in the campus community,

and believes that respect for one's self and others leads to a community characterized by integrity and honor. ESF is attentive to the health, safety and well-being of the community, realizing that its greatest assets are faculty, staff and students. Through this concern and compassion for others, the College strives for continual improvement and excellence in service provision.

As part of the State University of New York, ESF's service to the community extends beyond the bounds of the campus. The College is committed to sharing its discoveries and knowledge with public and private constituencies, organizations and citizens throughout our state, our nation, and the world.

One Hundred Years of Stewardship and Sustainability

The history of SUNY-ESF has its origins in late 19th century concerns about the destruction of Adirondack forests by logging, tanning, paper and charcoal industries and the 1892 creation of the Adirondack Park. A New York State College of Forestry was first established at Cornell University in 1898 to address these issues, but it soon encountered political turmoil by implementing a concept of "scientific forestry" that included a plan to clear cut 30,000 acres in the Adirondacks.

A group of wealthy "great camp" owners on Saranac Lake brought a lawsuit against Cornell for these actions and in 1903 succeeded in having the College of Forestry there closed. In the ensuing years, Syracuse University Trustee Louis Marshall, a constitutional lawyer who had been instrumental in the establishment of the Adirondack Forest preserve, made efforts to obtain New York State funding for a new college of forestry.

In 1911, the New York State College of Forestry was founded in partnership with Syracuse University. That first year, 52 students enrolled, with two faculty members headed by Dean Hugh P. Baker. Classes met in the basement of Lyman Hall of Natural Sciences on the SU campus. Under the direction of Dean Baker, the faculty and student body grew quickly, and forest lands for instructional and experimental purposes were secured.

The legislation which founded the College directed that its mission was "to educate people in the management and use of the forest resource for the benefit of man," and from the early years of its existence, College leaders saw the need to respond to the broader, rather than more specific, needs of environmental professionalism. Over the years, programs were added in design, engineering, and life sciences, as well as natural resources management and other areas of study, to serve this larger mission.

Student and faculty research aimed at understanding and solving environmental problems has always been one of the hallmarks of an ESF education. A government-supported study to identify firms using wood in New York State and the species and quantities of lumber they used was completed in 1912, just one year after the College opened, and was the forerunner of countless research projects conducted at the College since then.

In 1912, the College also opened its Ranger School in Wanakena, New York, on 2,000 acres of land donated by the Rich Lumber Company. The announcement of the Ranger School noted that field work in Silviculture, Forest Surveying, Estimating and Mapping, Forest Protection, Methods of Lumbering, etc., would take precedence over classroom work, but that theoretical and practical instruction would go hand in hand. Students and faculty spent two months blasting rocks and leveling ground for the first frame building which served as their classroom, dining room, kitchen, and sleeping quarters.

The State purchased 12 acres of land between Syracuse University and Oakwood Cemetery in 1913 to provide the main campus for the College. Four years later, Bray Hall was completed and the College gained a permanent home. There were no state funds available to hire vehicles and workers to move the books, furniture, desks, surveying and laboratory equipment and other college possessions from temporary quarters at Syracuse University to the new building. Faculty members and approximately 200 students volunteered their services and completed the move in just two days. Bray Hall remained the only building on the ESF campus until Marshall Hall's completion in 1933.

From its founding, students and faculty from the College of Forestry were very much a part of both academic and campus life at Syracuse University. Forestry students were enrolled in general education classes at the University from the start, and they took part in social activities with SU students while their own clubs appeared in SU's yearbook. Graduates of both schools have to this day received their degrees in a joint commencement ceremony held on the SU campus. ESF's academic and co-curricular relationship with Syracuse

University has been a defining feature of the College. It endures as one of the most interesting and productive partnerships in higher education today.

With the formation of the State University of New York in 1948, the College became recognized as a specialized college within the State University System, having been state-supported from the very beginning. The name was changed to the State University College of Forestry at Syracuse University, and the strategic direction of the College was increasingly linked to the priorities and politics of the larger university system. The College's Board of Trustees, first established by the state legislature to ensure a measure of independent governance from Syracuse University, retain the distinction of being the only campus-based board of trustees in the SUNY system.

Upon reaching its 50th anniversary in 1961, the College had achieved a position of leadership in forestry education and research extending well beyond New York State. Students from more than 20 countries were enrolled, and the faculty was defining a new interdisciplinary field of study in "world forestry." The College worked with the U.S. government to help the University of the Philippines to establish a college of forestry, and later worked with the United Nations to create a forest research institute in Burma (Myanmar). ESF today has student and faculty research projects underway on every continent, enrolls students from 37 countries, and is fully engaged in the international dialogue surrounding climate change, invasive species, and other worldwide environmental concerns. Approximately 15% of ESF undergraduates study abroad prior to graduation, and a unique off-campus program established by the Department of Landscape Architecture in 1970 has taken undergraduate students to more than 50 countries to engage in self-designed study projects.

In 1972, the College's name and focus were changed yet again, to better reflect the tradition and grounding of forestry in the environment, and to emphasize the broader environmental capabilities of our research and academic programs. By special act of the New York State Legislature, the College became the State University of New York College of Environmental Science and Forestry, and it bears that name today.

The fame and fortunes of colleges and universities are perhaps linked most directly to the quality and accomplishments of the graduates they produce, and ESF alumni have left a legacy of significant contributions to the advancement of natural resources conservation and environmental protection. A select list of ESF graduates best known for their environmental careers and activism includes:

- Perry H. Merrill (BS 1917) served as Vermont's state forester for 42 years and is called the father of Vermont skiing. He aggressively built access roads and ski trails while developing the state's forests and parks during the Great Depression, while negotiating public land leases that continue to support the park system today.
- Robert "Bob" Marshall (BS 1924) was a prolific writer and activist who is considered largely responsible for the wilderness preservation movement in the United States. He was a principal founder of the Wilderness Society and a great philanthropist in support of environmental causes.
- James D. Morrissey (BS 1958) an accomplished cardiovascular surgeon, led the first team of climbers to summit Mount Everest from the most challenging Tibetan (east) side in 1983.
- Howard "Bud" Ris (MLA 1975) served as president of the Union of Concerned Scientists for 19 years and helped it grow from a handful of scientists focused on nuclear arms control to a multi-issue environmental policy organization that has helped enact legislation to support the use of hybrid vehicles, improve safety at nuclear facilities, and provide tax incentives for renewable energy technologies.
- Joseph J. Martens (MS 1982) is currently serving as Commissioner of the New York State Department of Environmental Conservation, coordinating all state programs designed to protect and enhance the environment. He previously served as president of the Open Space Institute, an organization involved in the protection of more than 1.6 million acres of scenic, natural, and historic landscapes across the East coast.
- Anne Papageorge (BLA 1983) was entrusted with memorializing the more than 2,700 people killed at the World Trade Center in the attacks on Sept. 11, 2001, as senior vice president for memorial, culture and civic development with the Lower Manhattan Development Corporation (LMDC). She now serves as the Vice President of Facilities and Real Estate Services, University of Pennsylvania.

These alumni exemplify the hard work, dedication, and care for the environment that is typical of ESF graduates. They serve as examples for current and future ESF students as we continue to seek solutions to the world's environmental challenges.

As ESF celebrates its 100th anniversary, the College is proud to be recognized as the oldest and largest college in the nation focused exclusively on the science, design, engineering and management of natural resources and the environment. Under the direction of President Cornelius B. Murphy, Jr., ESF has taken a leadership role in developing alternative energy, protecting endangered species, creating sustainable environments, and addressing a broad range of environmental issues. The College now offers 22 undergraduate and 30 graduate degree programs, including eight doctoral (Ph.D.) programs, and is ranked among the nation's finest universities for its achievements in teaching, research, and community service. Student enrollments and donor support have reached new heights, and a campus transformation is underway as we celebrate the opening of the College's first student residence in Centennial Hall (LEED Gold) and the construction of a LEED platinum-rated campus center in our new ESF Gateway Building.

The State University of New York College of Environmental Science and Forestry stands tall, confident and poised to provide environmental leadership for a second century and beyond.

Chapter 4. Overview of the Self-Study Process

Nature and Scope of the Self-Study

This selected topics Self-Study provided the opportunity to capitalize on efforts already underway to integrate sustainability across campus. Since the completion of the *Vision 2020* Strategic Plan in 2003, ESF's infrastructure has transformed to reflect the College's commitment to sustainability. While these changes began earlier, the transformation has been especially notable in the past three years. This decennial reaccreditation process provided the opportunity for the campus community as a whole to articulate all that the College currently does with respect to sustainability and to engage the question of how to better integrate sustainability into planning, administration, engagement, education, research and operations at ESF.

Intended Outcomes of the Self-Study

- To empower a broad College constituency to participate in all aspects of the Self-Study process to ensure the representation of various constituencies and ownership of the process, its contents, and recommendations.
- To analyze ESF's current sustainability practices in terms of compliance with the MSCHE Standards of Excellence as indicated and to identify strengths and weaknesses in light of the College's mission and goals.
- To provide opportunity for campus-wide consideration of sustainability planning, administration, engagement, education, research and operations at ESF.
- To provide opportunity for campus-wide consideration of ESF's role in assisting and leading society toward 21st century sustainability.
- To further the College's understanding of and to articulate current sustainability efforts on campus, and to recommend ways to improve the integration of sustainability planning, administration, engagement, education, research and operations at ESF.
- To create a well-written document that records the analysis and findings that will serve as a platform for future improvements at ESF.

Organization and Structure of the Self-Study Steering Committee and Study Groups

The Steering Committee provided oversight of the process throughout the two year period of Self-Study and development of the Document Roadmap. The Study Groups were composed of a balance of faculty, staff, administrative and student representatives and they did the bulk of the work to document the status of sustainability efforts across campus. The Study Groups were also instrumental in conducting a first level analysis of the data collected.

Steering Committee Structure

Committee of 14 composed of a Chair, 3 staff, 3 administrators, 6 faculty and 2 students.

Chair:

Valerie Luzadis, Assistant Provost, Professor and Chair, Environmental Studies Department

Staff:

Robert Davis, Director of Forest Properties
Michael Kelleher, Director of Renewable Energy Systems
Danette Desimone, Assistant Director of Business Affairs

Admin:

Maureen Fellows, Director of Institutional Planning and Governmental Relations

Robert French, Vice President for Enrollment Management and Marketing
Cynthia Sedgwick, Dean of Student Life and Experiential Learning (ret 12/10)

Faculty:
Richard Hawks, Chair and Professor, Landscape Architecture Department
Rene Germain, Professor, Graduate Education Coordinator, Forest and Natural Resources Management Department
Kimberly Schulz, Associate Professor, Environmental and Forest Biology
Gary Scott, Faculty Governance Representative, Chair and Professor, Paper and Bioprocessing Engineering Department
Richard Smardon, Professor, Environmental Studies Department
Arthur Stipanovic, Chair and Professor, Chemistry Department

UG Student:
Timothy Wilke, Environmental Studies Major (Graduated May 2011)

Grad Student:
Anna Stewart, Environmental and Forest Biology, PhD Candidate

The Steering Committee charge is to provide leadership to the entire Self-Study process and to:

- Determine key issues for self-study,
- Prepare the design,
- Develop the charges to study groups,
- Coordinate the work of study groups,
- Ensure timelines are met,
- Arrange for campus hearings on the draft self-study, and
- Complete the final Self-Study report and Document Roadmap.

The Self-Study was completed in two phases. During Phase One data was collected and analyzed regarding ESF's current sustainability efforts, and Phase Two analyzed these efforts in terms of institutional goals and challenges.

Phase One – Documenting Sustainability at ESF

In Phase One, three Study Groups considered the question of how to better integrate sustainability planning, administration, engagement, education, research and operations at ESF, as listed below.

Each of these three Study Groups was asked to focus on sustainability relating to specific MSCHE Standards of Excellence and the Association for the Advancement of Sustainability in Higher Education (AASHE) STARS Sustainability framework, the dual foundation for the special emphasis on integrating sustainability efforts at ESF. Appendix 1 is an overview of the STARS framework and shows the links between it and the MSCHE Standards of Excellence.

The Sustainability Tracking, Assessment & Rating System (STARS®) is a transparent, self-reporting framework for colleges and universities to gauge relative progress toward sustainability. The STARS framework was developed by AASHE with broad participation from the higher education community and is designed to:

- Provide a framework for understanding sustainability in all sectors of higher education.
- Enable meaningful comparisons over time and across institutions using a common set of measurements developed with broad participation from the campus sustainability community.
- Create incentives for continual improvement toward sustainability.
- Facilitate information sharing about higher education sustainability practices and performance.
- Build a stronger, more diverse campus sustainability community.

The Steering Committee developed the following statement of principles to guide the Study Groups in their efforts to consider sustainability:ESF's Principles of Sustainability

We begin with a commitment to meet present needs without compromising the ability of future generations to meet their own needs. To do this we must:

- Understand basic functions of natural and social systems;
- Acknowledge and quantify the limitations of nature's capacity; and
- Develop solutions through the integration of social, economic, technological, and environmental systems

Study Group Charges

The first three Study Groups were charged as follows:

To analyze how to better integrate sustainability at ESF by:

- Using the AASHE STARS framework and pilot report and any other appropriate metrics identified to assess ESF efforts associated with the Study Group focus (AASHE STARS framework cross-referenced to the Study Groups is found in Appendix 1)
- Using guidance and experience developed by the American College & University Presidents' Climate Commitment (ACUPCC) and Second Nature, lead supporting organization of the ACUPCC

To analyze ESF's current sustainability practices in terms of assigned MSCHE Standards of Excellence

- To communicate with the Steering Committee and the broader ESF community as needed to address issues, culminating in a final Self-Study document
- To produce a coherent, well-organized, well-written report built through consensus and shared understanding within the established timeframe
- To propose recommendations to advance the institution as related to the research questions including possible ways to achieve them

Research Questions

- What is the current status of sustainability efforts at ESF as related to the MSCHE Standards?
- How well are sustainability efforts integrated throughout the institution?
- How might the College improve these efforts?Institutional Stewardship - Study Group 1

Focus: MSCHE Standards 1: Mission and Goals, 2: Planning, Resource Allocation, and Institutional Renewal, and 3: Institutional Resources

Membership

Chair:
John View, Director of Financial Aid, Scholarships, and EOP

Michele McNeill, College Accountant
Christine Langlois, Assistant Director of Physical Plant
Dana Piwinski, Development Officer
David Sonnenfeld, Professor, Environmental Studies
William Smith, Professor, Sustainable Construction Management and Engineering
Margaret Bryant, Assistant Professor, Landscape Architecture
Lewis Grove, PhD Student, Environmental & Forest Biology
Meagan Pepper, Undergraduate Student, Environmental Science

Governance and Administration – Study Group 2

Focus: MSCHE Standards 4: Leadership and Governance, 5: Administration, 6: Integrity, 8: Student Admissions and Retention, and 9: Student Support Services

Membership

Chair*:*

John Turbeville, Career Planning and Development Officer

Elizabeth Minard, Assistant Director of Admissions
Mark Hill, Senior Financial Aid Advisor
Bev Gracz, Senior Personnel Associate, Human Resources
Neal Abrams, Assistant Professor, Chemistry
Ruth Yanai, Professor, Forest and Natural Resources Management
Siddharth Chatterjee, Associate Professor, Paper and Bioprocess Engineering
Kathleen Barnhill, PhD Student, Environmental Science
John Swass, Undergraduate Student, Environmental Science

Education, Research and Outreach – Study Group 3

Focus: MSCHE Standards 10: Faculty, 11: Educational Offerings, and 12: General Education

Membership

Chair*:*

Diane Kuehn, Associate Professor, Forest and Natural Resources Management

Timothy Knight, Staff Associate, Environmental Science
Stephen Weiter, Director of Libraries
Charles Spuches, Associate Provost for Outreach
Alex Weir, Associate Professor, Environmental and Forest Biology
Myrna Hall, Research Associate, Environmental Studies
Douglas Daley, Associate Professor, Environmental Resource Engineering
Whitney Marshall, PhD Student, Forest and Natural Resources Management
Jason McCrea, Undergraduate Student, Environmental Studies Program, Green Campus Initiative

Phase Two – Institutional Analysis of Sustainability at ESF

Analysis of ESF's progress on meeting its institutional strategic goals was conducted by the Self-Study Steering Committee, the President's Cabinet, and the Academic Council. Members of the Steering Committee led efforts to analyze the material produced in Phase One in terms of three primary sustainability goals developed in 2007 for the MSCHE Periodic Review Report:

Goal 1 – *Education* - Enhance the student experience to produce graduates who use their knowledge to foster actions that lead to increasingly sustainable societies

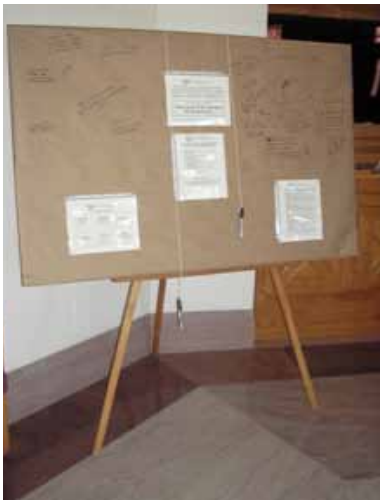
Goal 2 – *Research* - Grow the College research enterprise to foster sustainable societies

Goal 3 – *Demonstration* - Champion sustainability through on-campus modeling/demonstration of sustainable practices

These goals were analyzed to assess the College's current status in terms of the goal, additional targets, challenges ESF faces to reach these goals, and how the College is meeting or will meet these challenges.

Community Involvement and Input on Self-Study

Drafts from the study groups were reviewed and edited by members of the Self-Study Steering Committee, and returned to the subcommittees for adjustments. Comments from the study groups were considered for the subsequent drafts. Additional comments for improvement were solicited from the President's Cabinet, Academic Council, the Green Campus Initiative, the Graduate Student Association, the Undergraduate



Student Association, through an open forum during Earth Week, on open-space bulletin boards on campus, and at a meeting of Faculty Governance. A draft of the initial material for the Self-Study from the study groups was posted on the designated web page for review and comment by the campus community. Comments were collected through e-mail to middlestates@esf.edu. All input was analyzed to determine themes and frequencies for inclusion in this report.

The final Self-Study Report will be used by the College Administration and the ESF Board of Trustees as a foundation for improving ESF's sustainability efforts into the future. A convocation will be planned for early 2012 to discuss the report and to gather input on the prioritization of recommendations to implement.

Self-Study Report Organization

This report begins with a discussion of the institutional challenges that face the College as it endeavors to achieve the goals outlined in the 2003 *Vision 2020* strategic plan. This section identifies areas for improvement in College programming and operations, while the following section on the College's strategic planning goals identifies the areas where ESF has made progress in accomplishing specific strategic objectives and outlines the assessment mechanisms used to track strategic planning processes and outcomes. The first phase of the Self-Study surfaced a number of ideas for institutional improvement that were not directly related to sustainability. Some of these are presented in the general institutional recommendations associated with institutional challenges. The rest can be found in Appendix 2.

Given the intent to better understand and evaluate ESF's practice of sustainability through the Self-Study process, the next section of the report provides the definitional approach to sustainability used at ESF and articulates the College's sustainability principles. These principles guide the discussions and assessments in each of the three sustainability goal sections that follow. These three sustainability goals encompass the broad and interdependent concepts of education, research and demonstration, respectively, as these areas form the basis for *Vision 2020* and the existing framework for integration of sustainability into all College practices. The sustainability goal sections outline the progress made in achieving improved sustainability outcomes in each area, and relate the specific challenges in continuing to do so. Finally each sustainability goal section offers key findings and recommendations that will serve to guide the continuous improvement of sustainability integration in the future.

SECTION 2
INSTITUTIONAL CONTEXT

Chapter 5. Institutional Challenges

ESF points with pride to the quality and satisfaction of its graduates and the significant research and outreach products of its faculty. Nevertheless, institutional improvement and adaptation to changing circumstances are constant imperatives in College planning. As we look ahead to the next five to ten years, we see several actual and potential issues that deserve attention as we seek to advance the institution and achieve the goals we have set for ourselves. They are described here as institutional challenges. They affect the overall health, growth and development of the College and provide essential context for understanding the College's sustainability agenda.

Challenge 1: Obtaining adequate operational resources within a constrained environment

ESF has never had a surfeit of financial resources, but the recent economic downturn has exacerbated the financial limitations under which the College operates. Financial constraints and challenges occur on both the revenue and costs sides of the financial equation. Among the revenue constraints are:

- Limited control over tuition rates and limited ability to set student fees. Tuition rates for SUNY campuses are set by the New York State Legislature. As such ESF lacks the ability to independently establish a tuition structure that appropriately meets the College's operational needs or the supply and demand variables inherent in the student marketplace. In addition, approximately 80 percent of student fees collected by ESF must be approved by SUNY with significant input from the State legislature further restricting ESF's ability to set fees in a way that can appropriately meet the College's operational needs.

- Financial resource allocation through intra-system (SUNY) competition. State tax support for public higher education goes directly to SUNY which in turn determines how the allocation is distributed among the different campuses. Because of SUNY's diversity (including community colleges as well research universities), no single methodology has been found that allocates funding in a manner seen as equitable to all the campuses. Each methodology produces "winners" and "losers" and competitiveness among the different sectors. The problem is exacerbated in times of shrinking state appropriations, as has been the case over the past three years. For example, reductions in state aid based on the level of state tax support will favor those campuses for whom state tax support comprises a relatively small percentage of their total revenue and penalize campuses such as ESF for whom state tax support comprises the majority of its revenue. Alternatively, reductions based on the level of total state support (state appropriated funds plus tuition) will favor campuses for which tuition revenue comprises a relatively small percentage of total revenue and penalize campuses for whom tuition comprises the majority of its revenue.

- Reduced federal and state funding of research. The recent reductions in federal and state research funding have the potential to adversely impact the College's ability to carry out its research mission. It may further limit the collection of indirect cost revenues, funding for graduate students and partial reimbursement of faculty salaries. Receipts from sponsored research currently account for approximately 25 percent of ESF's total revenue. As such they are critical to providing the resources necessary to run the enterprise. A number of steps have been taken to enhance acquisition of sponsored research support including seed funding, faculty incentives, institutional support for identifying appropriate grant opportunities, and augmentation of research partnerships. Over the past five years sponsored research expenditures have risen 33%. Maintaining that growth is a challenge we must meet.

- Limited but expanding endowment. In the past 10 years, the College's endowment has grown remarkably, from $8 million to $25 million. The ESF College Foundation will provide $677,750 in scholarship support to both ESF undergraduate and graduate students in fiscal year 2011-12. An additional $234,850 will be provided by the Foundation to support ESF academic program initiatives and equipment purchases. As previously mentioned, the endowment is also playing a significant role in the establishment of ESF residence facilities for students. Nevertheless, the current endowment, about

$10,000 per student, is insufficient to replace the funds lost from contracting state and federal support and to provide the resources required to sponsor the excellence in programming to which we aspire. The College Foundation has just announced the public phase of its largest campaign to date. With more than $12 million collected, the Foundation expects to exceed its campaign goal of $20 million.

- Limited ability to increase tuition revenue by increasing enrollment due to staffing, infrastructure and housing constraints. In the long-term, increased enrollment, if supported by increased state funding could potentially produce a stronger financial picture for ESF. In the short term, ESF's ability to increase revenue through additional enrollment is limited by constraints in classroom and office space and configuration, housing, and other infrastructural components. In many respects, absent new investments exceeding the revenue that can be generated by the modest SUNY tuition, we are close to capacity at the present time. Nevertheless, the College is preparing for a future that may include enrollment growth. This year ESF will open its first residence facility, Centennial Hall, which will house 452 freshmen and upper-class students. A building that will contain admissions and outreach and serve as a new gateway to the campus is under construction. A new academic building, to be constructed on land purchased by the ESF Foundation, is in design. Baker Laboratory was renovated approximately five years ago with renovations planned for both Illick and Marshall Hall. Finally, a facilities master plan that considers facility requirements for planned growth through 2025 will be completed this year. Major cost constraints include:

- Portfolio of high cost programs dictated by institution mission: ESF is a STEM doctoral university. At the undergraduate level, our programs are primarily in the sciences and engineering. These programs are expensive to run because a large number of courses have laboratories requiring staffing and equipment. Doctoral programs in the sciences are also expensive because of the need for smaller class sizes and substantial graduate support. Maintaining several remote field stations, necessary in meeting our teaching and research mission, adds additional costs. SUNY's budget models have recognized these cost factors, resulting in a per student state appropriation to ESF that is higher than the allocation to most other SUNY institutions. However, state appropriations have not kept up with the costs of providing STEM education. Further, SUNY is currently in the process of reconfiguring its fund distribution model, and it is uncertain how the new model will treat the differential costs of diverse programs.

- Rising energy costs: Energy costs are the College's third highest expense category, after personnel and Syracuse University related accessory instruction and related service costs. As these costs continue to rise they consume resources that would otherwise be used to more directly carry out the College's educational mission. The College has put together and energy management team that has the objective to reduce energy costs by 10% in FY 2011-2012. Our new Gateway Building has an innovative combined heat and power system which will reduce energy costs by half a million dollars. A major design criterion for the new academic building on which construction will begin in 2013 is energy efficiency.

- Rising costs of research: While most of ESF's research enterprise is funded through external sponsors, the costs of faculty start-ups, matching funds required by an increasing number of research sponsors, a variety of research support services, and stipends for some graduate students and technicians are largely borne by the College. These institutional costs, required to maintain a contemporary research organization, are rising faster than the revenues to cover them.

- Salaries and benefits for most faculty/staff are set through union contracts that are negotiated for the entire SUNY system and outside local control: Employee wages and salaries account for approximately 70 percent of the College's state operating budget. SUNY-ESF does not have the authority to negotiate collective bargain agreements with the various unions and thereby establish a wages and salary structure that can appropriately meet the College's operational needs or the supply and demand variables inherent in the labor marketplace. While the same is true for employee benefits, the one difference is that benefits are funded by the State rather than directly from the College resources.

Challenge 2: Attracting and retaining quality, diverse faculty and staff within a constrained environment

Faculty quality is key to the success of any academic institution. ESF, therefore, devotes significant time and care to recruiting top quality faculty. The results have been gratifying. The faculty are a dedicated and accomplished group, serving our students and society well. Further, in most cases we have been able to recruit the faculty members we most desire. Staff recruitment has equally brought competent and committed people to the campus. While overwhelmingly the story is of success, several constraints pose challenges in future faculty and staff recruiting and retention.

- Identification of spousal employment opportunities: The most common reason why faculty candidates decline our employment offers is lack of appropriate employment for their spouse or partner. We work closely with neighboring academic institutions and with non-academic employers to find suitable positions for spouses, and are often successful, but not always. Spousal employment also affects retention. In the past two years, six faculty members have left ESF for positions closer to their spouse/partner.

- Salary structure imposes constraints on hiring senior faculty: Entry level faculty salaries at ESF are near the average for research universities. However, our salary structure increasingly departs (negatively) from the research university averages at higher professorial ranks. The differences are greatest in comparison to the private research universities, but they are also significant in comparison to public universities classified by the Carnegie Institute as "High Research Activity." The salary disparity has been narrowed in recent years due to campus initiatives and salary increases included in the UUP labor agreement, and there have been few cases where salary was a major factor in faculty retention. On the other hand, recruiting accomplished mid-career faculty members from research universities with higher salaries has proven somewhat problematic.

- Reduction in remitted tuition benefits from Syracuse University: Since ESF was separated from Syracuse University in 1948, SU has extended to ESF employees almost all of the benefits provided to its own employees. Chief among these was free SU tuition for employee dependants. This was especially valuable in recruiting and retaining staff. Last year that benefit was eliminated for ESF employees hired after September, 2010, and reduced for employees hired earlier. The effects of this policy change are yet to be realized, but anecdotal remarks suggest that the loss of these benefits could create a challenge in recruiting and retaining staff members with highly marketable skills.

- Rising expectations of new faculty for start-up funds: Start-up packages for top scientists and engineers recruited to research universities have grown exponentially in the last decade. Packages offered by many research universities far exceed ESF's capacity. To date, ESF has been successful in offering carefully negotiated packages to new faculty members that provide the necessities for success. Going forward, if growth in sponsored research is not maintained, and discretionary funds generated from the recovery of indirect costs shrink, providing basic start-up funds could be a challenge.

- Challenges in recruiting faculty from under-represented groups: As a value, ESF is committed to having a faculty whose demographic attributes are representative of society as a whole. The diversity of experience and perspective that would attend the fulfillment of this goal would enrich the campus conversation and enhance the education of our students. Further, it would aid in the recruitment of a student population that was similarly representative of society. Over the past five years we have drawn new faculty members from a broad range of geographic and cultural origins. We have made significant progress in recruiting female faculty members, increasing their representation from 20% to 28%. Almost half of the faculty members hired during the past five years (18 of 39) are female. We have not, however, made much progress in increasing the share of African-American, Hispanic or Native American faculty. At present, of our 135 tenure-track faculty, 18 are from under-represented groups. Under-representation of non-Asian minorities is typical in STEM fields, and our numbers are not below average for like academic departments. Nevertheless, the existing situation is not consistent with our objectives. Efforts need to be enhanced to achieve an appropriate level of diversity in our faculty. Among the challenges in

recruiting minority applicants is their paucity in the applicant pool. A second challenge is competiveness for qualified minorities as other institutions also seek to increase faculty diversity.

- Insufficient resources to replace faculty members who leave: The first challenge in recruiting quality faculty members is committing the resources required to support replacement (in kind or not) hires. Over the past five years, the College has been able to make that commitment and then some. In fall 2005, ESF had 130 faculty members with permanent, tenured or tenure-track appointments. In fall 2011, the number has grown to 135. However, it should be noted that the numbers in fall 2005 were depressed from earlier times as a result of the recession in the early 2000's, and the numbers in fall 2011 are down from a fall 2008 peak of 140, again in response to recessionary pressures. Further, growth in faculty numbers since fall 2005 has been possible only through two special initiatives (Empire Innovation and High Needs), funded by the State legislature outside of the SUNY campus allocation process. These two programs are responsible for nine new faculty positions in the College. Going forward, the College's ability to invest in new faculty hires will depend on improving economic circumstances. The most recent budget planning exercises offer hope that a modest increase in faculty numbers may be possible.

- Constraints in awarding merit-based salary increases: The vast majority of faculty and staff at ESF are represented by collective bargaining units. Contracts with these units, negotiated by the State of New York, have historically prescribed salary increases that are mostly "across-the-board" or based on time in service. For faculty and "professional" staff, about a quarter of the negotiated salary increase pool has been discretionary, or merit-based; for clerical and trade staff there is no provision for merit-based increases. Over the past five years the College has added to the prescribed salary increase pool for merit-based adjustments to faculty and professional staff salaries. The present financial circumstances suggest that additional monies for this purpose will be scarce for the foreseeable future. Further, salary increases outside of the negotiated contract are not permitted for clerical and trade staff.

Challenge 3: Rectifying inefficiencies created by an aging administrative infrastructure

One of the most serious challenges facing ESF in terms of administrative functionality is an inadequate ERP (enterprise resource planning) infrastructure. ERP is the standard term used to describe a university/college information management system. The ERP system is made up of many function modules (e.g., student information, Human Resources, financial aid, admission, registration). The problem is two-fold. First, ESF's ERP system is a home grown system, which has served the campus well for many years and provided some highly customized reporting features. However, the current practice is not sustainable and can no longer keep up with the ever growing demands for moving into a data driven decision making model. It is also not compatible with SUNY and Syracuse University platforms resulting in inefficient data-sharing with these vital partners. Investment is required in this area. Complicating the matter is that SUNY and Syracuse University are committed to different IT platforms (Banner vs. PeopleSoft). Second, the ERP system we rely on for data management and analysis is not sufficiently developed to meet all of the contemporary administrative needs. ESF works with a number of partners to meet its essential ERP needs – ESF, Syracuse University, the SUNY system, New York State Comptroller, and the SUNY Research Foundation. ESF does not control many of its essential ERP system components, and those who do have not optimized them for ESF's needs. Upgrades are currently in progress in several of the systems. College resources will have to be expended for training personnel on the new systems. At the same time, ESF is making significant investments in hardware that will improve data storage, access, and transmission.A second administrative challenge is directing human and financial resources where they are most needed. Technological advancements, the imposition of new mandates and an ever-changing business and social environment result in changes in unit tasks and workloads. In some cases new positions have been added to address new needs (e.g. addition of a sustainability manager, development staff, research support staff, and a dedicated career services director). In other cases, positions have been reallocated from areas of lower need to areas of higher need (most notably among academic departments). However, there is a need at this time to conduct a comprehensive College-wide examination of priorities and work demands to determine if the College's resources are optimally allocated.

A third administrative challenge is communicating administrative policies, procedures and protocols to those who would use them. The College has a well-developed (and award-winning) web site that is well equipped to serve this purpose. However, it is not used as well as it might be for lack of content. Additional documentation of policies, procedures and protocols is needed, as is additional development of tools for disseminating the information (e.g., enhanced utilization of the College web site and enhanced materials for employee orientation).

Challenge 4: Establishing and defining the College's position/brand in a remarkably changing global arena

Because of size alone ESF faces a challenge in being recognized. Compared to larger institutions there are fewer opportunities to draw attention to our efforts. We have no, and will not have, Division 1 athletics teams. The impacts of our efforts on the local economy tend to be smaller than large institutions. In addition, because of our historical connection to Syracuse University, and its size and influence, we have often been confused as being part of Syracuse University. Over the past 10 years great strides have been made locally and nationally to draw attention to the significant work and successes of ESF faculty and staff. This has resulted in a noticeable increase in student applications at the undergraduate and graduate levels, both from in-state and out-of-state students. State and federal legislators recognize ESF's expertise in the environmental arena and seek advice and partnerships with ESF in addressing environmental problems. Locally, the press recognizes ESF's independence from Syracuse University and ESF's contributions to solving environmental problems. Administrators, faculty and staff are regularly invited to serve on advisory boards for economic and community development. While much progress has been made, retaining visibility requires constant and innovative attention. The constraints imposed size and finances remain as the context for meeting this challenge.

Challenge 5: Enhancing and institutionalizing assessment practices to help drive advancement of institutional objectives

Institutional Assessment is an ongoing process at the College. The College's Policy on Institutional Effectiveness along with the ESF Cabinet Annual Planning Retreat Assessment and President's Mid-Year Cabinet Retreat Metrics set the institutional foundation for assessment each year. The Assessment of Institutional Effectiveness and Student Learning at ESF Report to Middle States submitted in March of 2009 details Institutional Assessment at the College. At the administrative level, administrative mission and goal statements, assessment plans and reports are reviewed annually. Data from a large number of student surveys including the SUNY Student Opinion Survey, National Survey of Student Engagement and the Annual Graduating Student Placement Survey are used regularly to assess programs and institutional goals. Academic and administrative unit assessment plans include timelines and use data collected institutionally and at the unit level. The Annual Cabinet Retreat integrates assessment plans with the overall strategic plan, as seen in Figure 1 of the 2009 Assessment of Institutional Effectiveness and Student Learning Report to Middle States (http://www.esf.edu/middlestates/documents/Assessment at ESF.jpg). While most unit heads regularly engage in assessment of their unit's efforts, the formality of these processes is still quite new to many of them.

SUNY-ESF's assessment of student learning helps to ensure that our students and graduates have knowledge, skills and competencies consistent with our educational goals. ESF's process for assessment of academic programs includes the requirement for all new programs to include student learning outcomes and a plan for assessing them. Additional assessment requirements are established and met through accreditation visits for many of our academic programs including Landscape Architecture, Engineering, and Forestry. Our 2009 Assessment of Institutional Effectiveness and Student Learning at ESF Report to Middle States documented our assessment process including academic program and administrative assessment plans with annual reports, and our College Policy on Student Learning Outcomes Assessment. The Academic Program Assessment Plans and Annual Reports are discussed in meetings with Department Chairs and the Provost and shared among all departments to improve teaching and outcomes-based learning.

Like many other colleges and universities, faculty and staff at ESF have expended considerable effort in the past few years to develop the tools and the culture to formally assess its programs and enhance their effectiveness. Much progress has been made. Policies have been written, assessment plans have been developed, and data is being collected and analyzed. But, this activity still requires attention and reinforcement until it becomes part of each unit's routine operation and is deeply ingrained within institutional culture. Further, for units that require institutional data for assessment, access to data needs to be improved.

Challenge 6: Meeting enrollment objectives in the face of new competitive programs within and outside SUNY

ESF has been very successful in meeting its targets for modest enrollment growth and improved student quality. Over the past five years undergraduate enrollment has grown from 1550 in fall 2005 to 1670 in fall 2010. For fall 2011 we are expecting 524 new students, one of the largest entering class in ESF's history. Further, average SAT and equivalent ACT scores for entering freshmen have risen from 1130 in fall 2005 to 1200 in fall 2011. Average high school GPAs have risen similarly. Nevertheless, competition for students, especially within SUNY, continues to be a challenge. In New York State alone, there are least 59 environmental science and environmental studies programs offered at both public and private institutions, with a full range of institutional size, quality and location (Assoc. Env. Studies and Sci., 2009). Despite a SUNY Memorandum to Presidents issued in 2000, reaffirming ESF's "primacy" in environmental science and environmental studies within SUNY, many SUNY institutions seek to establish such programs on their campuses. Additional programs could be justified if student demand called for increased System capacity. However, the existing programs outside of ESF remain small. At ESF, enrollment growth has occurred largely through out-of-state recruitment.

Challenge 7: Sustaining strong and vigorous Ph.D. programs that attract students, financially support their education and research and award degrees in a timely manner

As a doctoral research institution, a primary measure of our success is the production of PhD graduates who go on to make meaningful contributions to society through scholarship, teaching and other forms of service to society. Attracting quality PhD students and developing and graduating them requires, first and foremost, top quality research-active faculty members and, second, financial and physical resources to support these students and the research of their mentors. ESF has assembled a faculty that is very research-active and respected by its academic peers. Using sponsored research activity as a gauge, over 90% of the full-time ESF faculty members are engaged in sponsored research, the highest percentage among SUNY institutions; annual sponsored research expenditures are approximately $120,000 per faculty member, third highest in SUNY. Moreover, ESF's PhD graduation rate (62% within seven years) exceeds the national mean for STEM disciplines (58%). However, our success in attracting and graduating PhD students has been hampered by the financial packages that the College can offer. Our stipend levels are lower than those at many other research universities. Unlike many research universities, we have not been able to cover tuition for Research Assistantships funded through sponsored programs. Our financial flexibility has been limited by a number of factors, but our low indirect cost recovery (generally about 18% of direct expenditures) stands out. It is largely due to the high volume of research we conduct on behalf of organizations, such as the State of New York, whose policies greatly restrict payment of indirect costs. Increasing the indirect cost recovery is a top priority for ESF. The ESF Foundation has also made support for graduate students a top priority in the current Centennial Campaign.

Challenge 8: Achieving our diversity targets within our student population

As with faculty, we seek a student population that is representative of societal ethnic diversity. However, as several minority groups are under-represented in the population of college-ready high school graduates and in the population seeking degrees in STEM fields, our 2020 goal is to increase minority enrollment to 15%. Through enhanced recruiting and additional scholarship funding, in the past two years recruitment of students from minority groups has reached record levels – ten to eleven percent of the incoming freshmen have been

from these groups. Further, retention has been strong, thanks in part to the work of the Office of Multicultural Affairs which conducts a Pre-Orientation program for these students and offers additional support services. The College has also been able to significantly improve the academic qualifications of enrolling students from minority groups since 2005, and that has likely been an additional factor in improved retention.

An NSF grant funded "Environmental Scholars" program has provided substantial scholarship support and mentoring that has been helpful in boosting our number of minority undergraduates in the past three years, but funding for that program will end soon. Given the growing selectivity in undergraduate admission to ESF and the rigor of our academic programs, we believe that our most effective minority student recruitment strategies for the near term will be aimed at developing minority transfer partnerships with community colleges. These partnerships will help us grow the pool of qualified students from under-represented groups. In addition, ESF continues to evaluate its campus culture to ensure that it offers a friendly environment for students of color. Substantial challenges remain to building a student body demographically representative of society.

Challenge 9: Effective engagement of campus community in understanding and addressing institutional goals

Always, but especially in times of stress and transition, effective communication among administration, faculty and staff is needed to provide a common understanding of institutional challenges and objectives and to engage all members of the campus community in addressing them. While many mechanisms are in place to communicate and discuss College issues, concern remains among some faculty and staff members that institutional challenges and their resolution are not fully appreciated, discussed and owned by the entire community. Part of the issue at ESF is the historic tendency among faculty and staff, reinforced by administrative structures, to emphasize academic department success over institutional success. Furthermore, the campus-wide body for convening campus discussion, Faculty Governance, has until recently, been under-involved. Significant changes in Faculty Governance in the last year, including an increase in authority and increased faculty and staff numbers on Faculty Governance committees, are rejuvenating the organization, offering promise that it can serve as an effective forum for campus discussion. Transformation of the organization is a work in progress requiring the continuing support of faculty and administration.

One of the issues most in need of a common campus understanding is the meaning of sustainability. ESF was founded with the purpose of educating foresters to manage forest lands so that the resources on them could be used and renewed *in perpetuity*. The ethos of sustainability is thus at the very core of ESF values. In recent years, as sustainability has become a global cause, the word and the idea have taken on broader contexts. At the same time, the term has come to be understood differently among individuals, especially those from different disciplines. The process of this Self-Study started the conversation at ESF, and more discussion is necessary to communally forge a common vision.

Challenge 10: Fitting ESF's strategic plan within the SUNY Strategic Planning Objectives to obtain benefits of System membership

With the arrival of Dr. Nancy Zimpher as SUNY Chancellor three years ago, SUNY undertook a strategic planning effort focused on harnessing the assets and capabilities of the 64 System schools to address significant State needs. The result is "The Power of SUNY," a strategic plan that address six issues: (1) developing new businesses, (2) creating a more educated workforce, (3) improving the health of New Yorkers, (4) reducing energy use (especially from non-renewable sources), (5) enriching the quality of life in communities, and (6) connecting New Yorkers with the world. As SUNY seeks to deliver on these goals, much of the System's thinking and resources will be devoted to these issues. ESF's success in obtaining System support over the next several years will thus depend on our ability to connect our strategic goals with those of the System. With a little work, this is not a difficult challenge. ESF is already actively engaged in each of these areas with plans in place to initiate new activities that further support SUNY's strategic goals. For example, we have just completed planning for an environmental health program, in conjunction with a neighboring SUNY institution, Upstate Medical University that materially contributes to the health goal. Many other examples could be cited. The primary challenges are of focus, communication, and collaboration.

Challenge 11: Maintain effective relationships with Syracuse University and other partners

ESF began in 1911 as a college within Syracuse University (SU). In 1948, when the State University of New York (SUNY) was created, ESF was established as an autonomous unit of the SUNY system. In the separation, ESF was still dependent on its former host for many support services, as it would have been inefficient to duplicate them on the two adjoining campuses. ESF and SU have enjoyed a close and cooperative relationship since their separation with students taking courses across campuses and faculty from both campuses conducting instruction and research together. Many activities are joint activities, including Commencement and an August convocation for entering students. With respect to many student services, SU treats ESF students as their own, as per the Student Services Agreement. Despite the long and cordial relationship between the two institutions, there are continued challenges to making the most of the relationship. Coordination efforts take extra work across campus lines. A recent example is the effort that has been required to prepare for ESF to house students for the first time. With the opening of an ESF residence hall, the long-established roles that SU and ESF have played in managing resident life must be rewritten. A third challenge is the increasing costs of procuring SU services. These costs, rising with Syracuse University tuition, are challenging ESF's ability to pay them. Recognizing the issue, Syracuse University has offered relief, and efforts are underway to forge a new more mutually beneficial inter-institution agreement beginning in 2013. Related to this is the opportunity of forging new collaborations with other SUNY institutions, particularly our neighbor, Upstate Medical University, and the other SUNY institutions in central New York, to reduce operating costs and generate income.

Recommendations for Future Action

Advancing many of the institution's goals is dependent to a greater or lesser extent on acquiring additional financial resources. Recommendations for doing so are as follows:

- Continue to increase enrollment of out-of-state undergraduates through maintenance of strong national visibility and marketing initiatives.
- Increase enrollment of tuition-paying graduate students through the development of focused Master's Degree programs feeding strong employment markets.
- Build upon the success of the ESF Foundation's Centennial Campaign to enhance private giving by reinvesting Foundation proceeds to increase the size of the development staff.
- Increase sponsored research funding by focusing faculty hiring in fields having significant opportunities for extramural support (e.g. ESF's new initiatives in environmental health and renewable energy management), and through hands-on assistance from the Research Office in helping faculty identify appropriate funding opportunities.
- Increase indirect cost recovery from sponsored programs by focusing on grant opportunities that permit reasonable indirect charges, including federal agencies and some private organizations.
- Continue to develop newly introduced summer program (2010), concentrating on distance-learning and short-term field experiences.
- Maintain strong visibility and value to SUNY to ensure System understanding of ESF's mission and the special challenges that derive from that mission.

Obtaining adequate financial resources to meet institutional goals also requires seeking and enacting efficiencies. Recommendations for achieving financial efficiency are as follows:

- Reduce energy costs by reducing energy dependence on high cost Syracuse University steam by installing high efficiency power plants in new ESF buildings, by adding solar panels and wind turbines where possible to ESF facilities, by acting on the recommendations of the recent National Grid power of audit, by making energy efficiency a primary criterion in new building construction and in renovation

projects, and by enacting new recommendations that will come from the recently formed ESF energy management team.

- Renegotiate the Accessory Instruction and Related Services Agreement with Syracuse University to include terms that meet the needs of both institutions.
- Work with Upstate Medical Center and other Central New York SUNY institutions to identify services that may be shared to reduce costs to all institutions.

Aside from recommendations specifically related to achieving financial flexibility, the following are recommended:

- Develop a new five-year academic plan to identify and address high priority areas for advancing the mission of the College.
- Continue to invest a portion of the salary savings from faculty retirements in merit raises to recognize and retain high performing faculty members.
- Develop a plan for adding under-represented minorities to the faculty.
- Thoroughly assess institutional technology needs now and in the future, and develop and implement a plan that meets those needs.
- Improve the utilization of information systems through enhancement of ESF's home system and through training of ESF employees on data systems managed by supporting agencies including the SUNY Research Foundation, SUNY, and other state agencies.
- Include documentation and dissemination of policies, procedures and protocols as part of employee performance programs where appropriate.
- Continue to seek and secure strategic alliances with external partners, public and private, academic and non-academic to advance institutional goals and service to society.
- Maintain strong relations with Syracuse University. Seek additional opportunities for coordination and cooperation.
- Continue to incorporate assessment and improvement as routine operational practices.
- Maintain effective visibility efforts. They advance almost every aspect of the College's agenda.
- Take advantage of the new energy in Faculty Governance to facilitate campus-wide communication and to engage the faculty and staff in meaningful dialog to promote understanding and consensus on major College issues.

Chapter 6. Strategic Planning and Progress at ESF

This chapter reviews the ESF strategic plan, *Vision 2020*, indicating the College's current progress toward meeting each of the seven strategic goals.

Goal 1: Enrich Academic Excellence in Both Undergraduate and Graduate Education

Advancing Academic Programs

The College has been working hard to advance its academic programs since the development of the 2003 strategic plan. According to the American Society for Landscape Architecture, ESF has established top five programs in Landscape Architecture at both the undergraduate and graduate levels. ESF is also proud to offer a top five program in the Paper Science and Engineering program and a top ten program in the Forest and Natural Resources Management program (see Appendix 4 for a list of rankings and ratings).

An institution of higher education must evaluate the effectiveness of its academic programs relative to the needs of society. In consideration of this responsibility, and since the finalization of ESF's 2003 strategic plan, the College has developed the following undergraduate programs:

- BS Biotechnology
- BS Bioprocess Engineering
- AAS Land Surveying Technology
- AAS Environmental and Natural Resource Conservation

The following undergraduate programs have been approved by the College's Faculty Governance and are being submitted for approval to SUNY Administration (Provost's Office) and the New York State Department of Education:

- BS Environmental Health
- BS Energy Management

The College continues to review its academic offerings to meet the needs of future students. For example, based on a review of ESF applicants and the performance of current students, the College offered a summer bridge program in support of the AAS programs in Forest Technology and Survey Technology at the ESF Ranger School in Wanakena. An assessment of student performance in these programs, clearly demonstrated that incoming students lacked analytical skills and backgrounds in biological sciences. A four week summer bridge program was established to assist in developing knowledge in these two areas. A preliminary assessment suggests that this bridge program has been successful in achieving improved student performance in the Forest Technology and Survey Technology programs.

With a focus on outcome-based learning, it is very clear from ESF program-based advisory councils that more curriculum focus is needed in the enhancement of communication skills and professional experience outcomes. As a result, most departments have enriched academic offerings to require greater emphasis on developing these skills. Course offerings such as FOR 496/796 "Professional Communications Skills," offered by an ESF Visiting Professor of Entrepreneurship, give students the opportunity to develop and improve written and oral communication skills.

As an example of the College's response to the need for increased professional experience, ESF's Paper Science and Engineering program requires all of its students to participate in an internship, research program or paper industry coop program where lecture and laboratory experience is synthesized in a business environment. The feedback is provided to both the students and the faculty by the practitioners based on the student performance during the coop experience. The Department of Environmental Resource Engineering also requires all of its seniors to participate in a capstone experience taking on a real life engineering problem posed by engineering firms or public agencies, developing solutions, working in teams of four and presenting their findings to professionals working in the area of environmental engineering. The presentations are

evaluated by the practicing engineers and feedback is provided to both the engineering students and the faculty. Adjustments are made to the capstone experience based on that feedback.

Additional academic program certification, accreditation and validation have been achieved over the last 8 years consistent with the strategic plan. Some of these new certifications and accreditations include:ABET Accreditation of our Survey Technology AAS program

- SAF Accreditation of our Forest Technology AAS program
- SWST Accreditation of our Wood Products option of the Bachelor of Science in Wood Products Engineering degree program

These accreditations join the current list of ESF academic program accreditations:SAF Accreditation of the Forest Resources Management undergraduate program

- SAF Accreditation of the Masters of Forestry program
- ABET Accreditation of the BS program in Paper Engineering
- ABET Accreditation of the BS program in Forest Engineering (Environmental Resource Engineering)
- ASLA Accreditation of both the BLA and MLA degree programs in Landscape Architecture

ESF is committed to regular reviews of program offerings and to seeking additional academic program certification, accreditation and validation in the future.

Enhancing Faculty and Research Strengths

The State University of New York created the Empire Innovation Program in 2007, which provides assistance to research campuses as they seek to increase their experienced research faculty in order to "compete successfully for additional federal grants and contracts, and also contribute to technology transfer and economic growth." The College's successful proposal to the program led to the addition of eight faculty in strategic academic research areas. This effort was supplemented by a proposal to SUNY to add faculty under the Critical Needs Program.

The process of selecting both the need disciplines and the faculty additions to represent those disciplines was led by ESF faculty through Academic Council, with guidance provided by an Empire Innovation Search Committee. The specific emphasis was to add capacity in the area of "Global Environment, Health and Sustainability."

Despite the ongoing economic downturn, ESF has been able to exceed the strategic plan goal to "Strategically recruit and hire at least eight new exceptional faculty members." The following exhibit charts the College's progress in this area:

Table 1. Faculty Recruitment Since 2003

	Total Full Time Faculty	Total Full Time Equivalents
2003	120	131.7
2004	123	135.0
2005	128	140.2
2006	127	138.6
2007	134	150.3
2008	138	146.7
2009	134	147.5
2010	137	151.5

Advancing Student Recruitment, Performance Standards, Services and Diversity

ESF operates as an institution that is driven by the quality, focus and passion of its students. The incoming freshmen for the 2011-2012 school year will continue the trend of increasing the quality of ESF's student body. For the first time, in Fall 2011 the average SAT/ACT score of incoming students reached 1200 and the average high school performance will exceed 92%. The College is proud of its recruitment progress since 2003. ESF has exceeded the strategic planning goal for admitting 90% of its freshman class under SUNY's "mostly selective" or "highly selective" criteria for the past several years with more than 95% of the fall 2011 class qualified at this level. The following exhibit charts progress in this area:

Table 2. Student Recruitment Selectivity Since 2003

Fall	Average Combined SATs	Average High School GPA
2003	1131	88.6
2004	1136	88.2
2005	1145	88.9
2006	1112	88.9
2007	1150	90.14
2008	1160	90.45
2009	1195	91.86
2010	1169	91.55
2011	1200*	91.85*

*Average scores include ACT scores converted to SAT scale

Since the preparation of the strategic plan, the College's Retention Team has undertaken two comprehensive studies to assess the progress of increasing retention and 6-year graduation rates. The first study was completed in 2002, and involved the implementation of the following practices:

- extension of math preparedness assessment and course placement assessment to transfer students;
- offer a general biology course for non-majors instead of the then current botany-zoology sequence;
- implementation of ways to decrease the lower division class size, particularly for general chemistry and biology;
- place a greater emphasis on academic advising;
- enhance student support services (Student Success Center).

These recommendations were implemented following the establishment of a 2001 policy that all resident freshmen must participate in a residence-based learning community. These actions have helped to stabilize the first year attrition of entering freshmen. The freshman to sophomore retention rate averaged 85% (with a high of 89%) over the period of 2002-2010, since the creation of the *Vision 2020* strategic plan and the implementation of the Retention Team recommendations.

The most recent and comprehensive Retention Committee report was completed for the 2009-2010 academic year. The team reviewed both the "Best Practices for Student Success by SUNY Campuses" as well as the 10 "high impact educational practices" identified by George Kuh, a nationally known retention expert, to increase rates of student retention and student engagement. The team evaluated seven of ESF's retention-related programs and recommended 27 specific recommendations meant to enhance the success of existing programs to facilitate student success, retention, and graduation rates.

ESF is in the process of implementing 7 of these recommendations for the 2011-2012 academic year for the following retention programs:

- Mathematics Assessment and Placement
- New Student Orientation
- Student to Student Mentoring*
- ESF Learning Community
- ESF 132 and 332 Courses
- Academic Support Services – Peer Tutoring Program
- Educational Opportunity Program (EOP)

*Involved a student survey as part of the assessment, which identified mentoring as a top retention recommendation

With 6-year graduation rates ranging from 64% to 72% and averaging 67% for the 2002-2004 cohorts, ESF has developed an ambitious strategic plan objective of 80%. In comparison, the SUNY four-year college campus 6-year graduation rate is 58%, and the rate is 45% for publicly funded universities in the U.S.

The College's most challenging goal in our plan for enriching academic excellence is to "achieve a diverse student body such that 15% of the graduating students are from under-represented populations." ESF continues to make significant gains in enrollments of under-represented populations, an important step in this process (Table 3).

Table 3. Student Diversity Since 2003

2003	6%
2004	11%
2005	10%
2006	8%
2007	9%
2008	7%
2009	10%
2010	12%
2011 (est.)	11%

To improve diversity, the College continues to apply and receive grants from the State University of New York to support the areas of access, program research, student development and leadership, enhancing program outcomes, improving the quality of student life, and the use of technology.

The College has also been aggressive in seeking grants from the New York State Education Department under the Collegiate Science Technology Entry Program and the National Science Foundation to provide programming and services to students who are aspiring to careers in science, technology, engineering and mathematics. Many of the students served under these programs are students from under-represented groups.

The Office of Multicultural Affairs assists with recruitment of minority students, provides student life support for students from under-represented groups, celebrates diversity, supports lunchtime learning seminars, supports international students and conducts a 3-day pre-orientation program for students from under-represented groups. A complete representation of services is provided on the Multicultural Affairs webpage (www.esf.edu/students/multicultural/).

Goal 2: Provide an Outstanding Student Experience

The strategic plan calls for the College to "provide adequate scholarship dollars to ensure successful academic performance." The College increased financial aid to students by more than 47% from the baseline of FY 2003-04 to FY 2010-11 (Table 4). Of this aid, scholarships provided by the College or the College Foundation grew by 68%. Much of the increase in financial aid provided over this period was required to offset an increase of approximately 30% in undergraduate student costs, coupled with a 29% increase in ESF's number of full-time undergraduate students enrolled (1,209 to 1,558). A 100% increase in undergraduates enrolling from outside New York State over these years (128 to 256) was an additional factor, due to their higher tuition costs and resulting financial need. ESF recognizes that attracting and retaining strong performing students requires significant financial aid commitments.

Table 4. Student Financial Aid Growth Comparison

Category	2003-2004	2010-2011
Total of All Aid	17,706,908	26,014,277
Total of All Loans	7,970,603	11,116,218
Total of All Federal Grants	1,188,741	2,445,774
Total of All State Grants	1,373,343	1,539,504
Total of Grad Tuition Scholarships	1,251,916	1,393,598
Total of Other Institutional Scholarships	887,648	2,198,712
Total of All other Funds	**5,034,65**	**7,320,471**

In addition to financial aid commitments, one of the most important responsibilities of any institution of higher education is to provide a safe and supportive learning environment. This starts with a clear and well understood statement of the College's Values; the Student Code of Conduct; training of faculty, staff and students relative to dealing with sexual harassment and potential violence in the learning environment and work place. This is secured by having a well-trained and vigilant unit of University Police.

Following the implementation of the strategic plan in 2003, ESF has undertaken the following initiatives to further ensure a safe learning environment:

- upgraded the blue light emergency call system;
- worked with members of the University Hill Corp. to get all of the institution security and police units on the same communication system;
- provided enhanced training to University Police;
- updated the support agreement with the City of Syracuse Police Department;
- prepared Emergency Procedure manuals for three principal campus locations;
- provided training to students on safe practices on and off campus through the 132 courses and the learning communities;
- strengthened both education and consequences associated with the excessive consumption of alcohol and other drugs;
- added a senior counselor to student affairs;
- planned implementation of the Red Band program this Fall.

Figure 1. ESF's Study Abroad and Research Locations

In 2007, the ESF College Foundation acquired a 32 acre dry forest ranch near Costa Rica's Pacific Coast. The facility has been repurposed as the Costa Rica Field Station, named the Sundt Field Station (http://www.esf.edu/communications/view.asp?newsID=845) , providing an opportunity for research and immersion education in tropical ecosystems. Since its acquisition, it has been utilized by 6 faculty and approximately 75 students.

A current proposal involves the acquisition of a property in Namibia to provide a similar opportunity for ESF faculty and students to study the ecosystems of Africa. It is expected that the option to achieve a presence in Namibia will be reviewed with the ESF College Foundation Board and the ESF Board of Trustees this fall.

The most vibrant of ESF's international programs involves the Landscape Architecture Off Campus Program, which has provided opportunities for undergraduate LA students, who are required to complete a fifth year, to study at one of 183 sites in 53 countries.

To support the growth of these international opportunities, the College hired an international program coordinator in 2008. During the 2009-2010 academic year 74 LA students participated in study abroad experiences. The number of participating students has grown from 54 students with experiences in 7 countries for AY 2002-2003 to 74 students with experiences in 17 countries for AY 2009-2010 (Table 5).

Table 5. Study Abroad Program Participation

	Number of Students	Number of Program Options
Year	Participating	
2000-01	54	8
2001-02	51	8
2002-03	55	7
2003-04	66	7
2004-05	68	11
2005-06	58	9
2006-07	57	11
2007-08	46	9
2008-09	47	7
2009-10	74	17
2010-11	100	24

ESF will continue to expand its international presence and global reach. The College has approximately 40 articulation and cooperative international agreements. The newest agreements exist with Sichuan University for a dual diploma agreement with Sichuan University and a similar agreement with the Beijing University College of Technology. Four ESF students and a faculty member traveled to Sichuan University approximately a year ago while five students from Sichuan University are joining the bioprocess engineering program this fall.

Lastly, ESF recognizes that an outstanding student experience requires continuous improvement in faculty and student interaction. The College participates in the State University of New York Student Opinion Survey every three years and the National Survey of Student Engagement survey every two years. Both of these survey/assessment tools suggest that ESF students have been very satisfied with their academic experience (#1 of the 6 Doctoral Sector Institutions in SUNY) and have responded very favorably to having discussions, meetings, or conversations with instructors outside of class (#2 of the 6 Doctoral Sector Institutions in SUNY). Students have not responded as favorably to the effectiveness of faculty academic advising.

The College administration continues to encourage strong faculty and student interaction and has seen an increase in faculty participation in several student- centered social events (e.g., Spring Soiree). The College, through the Provost's Office, has strengthened the emphasis on faculty advising, by conducting a faculty symposium focusing on best practices. The Student Opinion Survey results suggest that faculty advising has improved over the last few years.

Goal 3: Be the "go-to" institution with a strong and visible reputation.

Since 2000 there has been significant emphasis on enhancing the visibility of ESF in an effort to raise the College's public profile. Already well known in academic circles, the College has the potential to become more generally recognized as one of the finest environmental science and forestry programs in the country, if not the world. To do so, the College must develop methods to reach wider and more diverse audiences.

This visibility effort calls for a sustained, coordinated, multi-pronged approach encompassing marketing, communications, publications, public and media relations, and government and community affairs. This increased visibility will, in turn, enhance faculty and student recruitment, fund raising, alumni relations, and government relations.

Creating brand-name recognition and attraction

The College's visibility efforts have increased dramatically since the strategic planning process began in 2003. Major initiatives include:

- A cable television advertising campaign covering much of upstate New York has been carried out annually since 2007.
- ESF advertisements have been placed in newspapers, magazines and event-specific publications, including U.S News & World Report and USAir magazine.
- The Undergraduate Admissions Office conducts one of the largest direct mailing advertising campaigns in the nation each year, sending a promotional brochure to approximately 120,000 high school students. In 2011-12 ESF also advertised in a college guidance magazine that was mailed to an estimated 600,000 high school students.
- The College has dramatically improved its visibility and brand on the Web, in the process winning awards from the SUNY Council for University Advancement. Recent efforts have focused on the development of ESF-branded social media sites on Facebook, Twitter, Youtube, iTunes University and LinkedIn.
- ESF Hosted a major news event, the NPR broadcast of the Science Friday show.
- The College established an intercollegiate athletics program, with accompanying ESF "Mighty Oaks" uniforms and logo.
- ESF established an official ESF mascot, Oakie the Acorn, who makes appearances both on and off-campus as appropriate.
- Expanded opportunities for the media to come to campus for demonstrations of research and education projects. This was rarely done prior to 2003; now it occurs four to six times each academic year.
- The College defined its campus with extensive signage (which helps ESF distinguish itself from its large and widely recognized neighbor, Syracuse University).
- The Office of Communications developed a "Going Green" series of weekly television spots in partnership with YNN that reach an estimated audience of 1.72 million people.

The College administration expects all of the initiatives above to continue through 2020. In addition, for the duration of the strategic planning period, the College will continue to build name recognition through a highly visible celebration of the College Centennial that includes a high-profile centerpiece event on campus, a 50-page magazine and a 30-minute video about the history of the College.

ESF is a major player for environmental consultation through its teaching, research and outreach programs carried out by 135 research-focused faculty and 500 graduate students; the initiatives described above provide additional capacity to highlight and expand this role.

In addition to multi-sector consultation, the College determined it could enrich the science programs in area high schools by providing an opportunity for students to take environmentally-focused courses. ESF in the High School is a partnership program between SUNY-ESF and High Schools throughout New York State that enables qualified students to:

- experience college-level course work while still in high school
- understand the complex scientific and social perspectives behind the environmental issues that make headlines every day, such as the relationship between energy and the environment
- learn about and explore diverse interests and career opportunities in environmental science, engineering, management, policy and design, and in related areas such as law, communications, technology and medicine

Course offerings for high school students include two of ESF's environmental science classes, the Global Environment and Writing and the Environment, which can be taken for three college credits each. Key

environmental science themes and critical thinking skills form the basis for classroom and experiential learning activities. The Global Environment's interdisciplinary approach reflects the College's enduring belief that all students, regardless of their specific college and career paths, will benefit from an understanding of the linkages among human social systems and biophysical systems.

There are approximately six online courses offered through the ESF Outreach Office that attracted 72 participating students during the 2010-2011 academic year. This is an area offering significant growth in providing learning opportunities to both traditional and non-traditional students.

Establishing strength in marketing and external relations

The College hired its first top-level administrator with expertise in marketing when the position of Vice President for Enrollment Management and Marketing was created in 2006. Since 2004, four additional staff members have been added to the Office of Communications:

- The webmaster, now associate director of the office, integrates the College's Web presence with overall campus communications efforts
- A media relations coordinator plays a key role in the development of video content used for marketing purposes on the Web and television; this has significantly expanded the College's interaction with the media
- A graphic designer/production coordinator helps handle an increase in the workload, contributing design and print-purchasing skills
- A web developer, brings technical skills and allows the webmaster to focus on higher-level web design and ESF's growing participation in social media
- Other staff responsibilities were expanded to assist in organizing ESF's participation in major community events such as the New York State Fair
- In 2003 the College established its Institutional Advancement Team

The visibility budget, which funds initiatives such as advertising and College participation in public events, has increased by 104 percent since 2003. During the same period, the budget for personnel in the Office of Communications has increased 105 percent and the staff has grown from four full-time and one part-time staff member to eight full-time people.

The College's expertise in marketing and external relations has been recognized by professional organizations such as the SUNY Council for University Advancement and the Council for the Advancement and Support of Education. ESF has received 30 awards for its institutional advancement work since 2003.

During the next phase of the strategic planning period, the College will continue to focus on web-based communications and further growth in the use of social media. The Office of Communications will also continue to be highly innovative, adaptive and capable of adjusting strategies to fit the changing communications environment.

Since 2003, the College has utilized an array of print, broadcast and Web tools to make ESF a vital and dynamic source for environmental news:

- In the 2004-2005 academic year, the College tallied 564 media placements. For each of the last four years, we have counted approximately twice that amount.
- Column inches of coverage in newspapers and magazines increased from 6,271 in 2005 to 9,400 in 2010. Mentions in state and regional media increased from 99 to 298 in the same time period and publications jobs increased from 112 to 187.
- In 2005, ESF contracted with Newswise, a service that distributes news internationally. This has resulted in placement of at least 20 different stories in media around the world and has produced thousands of column inches of coverage about ESF.

• In partnership with YNN television, the College produces a weekly two-minute environmental feature called "Going Green" that is broadcast in every region of the state except New York City and Long Island

• The College produces a half-hour television show called "Improve Your World" that is broadcast on Syracuse University's Orange Television Network.

• The College produced a 26-part video series called "Nature in Your Backyard" that was broadcast on local television

• The Office of Communications has expanded its online news feeds to include contributions from faculty and students, resulting in a broader offering of news and feature stories and an engaging variety of voices that report the news. This has contributed to an increase in online news stories: in 2003, ESF's news archives list 85 news items that were posted online that year. In 2011, the number will be approximately 115.

Between now and 2011, the College will expand its media relations program beyond the Northeast, building on relationships established since the strategic planning process began; build an active group of faculty and students who contribute news to the college website and blog about their research and experiences; develop an experts guide to make it easier for the media to connect with ESF scientists.

As an increasingly important tool in marketing and external relations, and in addition to ongoing expansion and improvement of traditional academic and administrative websites, several initiatives are underway to extend ESF's online presence:

Educational and Sustainability Related Web Content

- ESF's "E-Resources" and "Sustainability" websites offer a rich resource for online information seekers. Hundreds of pages and videos cover topics such as soil pH, tent caterpillars, snakes of New York, sustainable homes, invasive species, making maple syrup, and a great many more. Also, the College's newly launched Google map-based interactive "Around the World" provides a useful web front for ESF's extensive web coverage of fieldwork and international research, which includes sites on work in Honduras, Antarctica, Cyprus, Bermuda, Dominica, the Adirondacks, Costa Rica, Africa, Russia, China and elsewhere.

Public Distribution of Educational and Course Media

- ESF continues to publish public education and academic course media on iTunes U. The College offers video and audio series on sustainability, regional research, water resources, 'green' practices, backyard nature and more. Course media sets include Physics of Life, Global Environment, Animal Physiology, Chemistry, Biology, Probability and Statistics, etc. Tracks currently number over 550. ESF produces two YouTube channels—one dedicated to academics, the other to news, information, events, how-to information and service. Together, they currently feature more than 425 videos. ESF re-publishes print media online via Issuu.com.

Social Network Presence

- ESF now maintains 16 dedicated Facebook pages as interactive venues for target audiences, with current followers numbering about 7000. The College Twitter feed is used to broadcast news and research updates to 900 followers that include numerous NGO's, government agencies, academic institutions, businesses and media outlets. Two LinkedIn groups serve over 1000 members who are interested in career advancement and networking. Several student and faculty blogs are consolidated on ESF's Wordpress.com web front.

ESF Community Online Services

- Students, faculty and staff can take advantage of several recently implemented online services, including ride sharing, a graduate student public information database, campus-wide news and events sharing, and more.

Upcoming Initiatives:

Mobile Web

- In response to the rapid increase in the use of mobile, small-screen computing devices, all college websites will be recoded using "mobile first" principles in the next major redesign, scheduled to take place across the next 18 months.

Campus Social Network

- The College has near term plans for a dedicated social network to serve the ESF community for unique, internal interaction. Features may include 'spaces' for cross-course sharing and presentation, academic galleries, student organizations, a test files bank, residence hall groups, ESF classifieds, roommate exchange, etc.

Blog Model Online Publishing

- ESF is working to offer faculty members, researchers and students blog engine driven web authoring with advanced distribution and embedding options. The system will enable the ideas, expertise and current work of the ESF academic community to be published in multiple internal and external venues, with options for subscription.

Advanced Media Archiving and Access

- ESF's burgeoning media collection is currently dispersed, variably accessible, and erratically associated with metadata. Our goal is to develop a scalable repository of searchable media available online for academic use, and to have this system serve as the foundation for the College's public distribution efforts.

Simplification, Reduction, Currency and Access

- With the rapid accumulation of online assets, there is a growing need for new management methods that yield ordered archiving, information currency and 'bloat' reduction. ESF is working toward an approach that is comprehensive, efficient and adaptive.

In sum, ESF continues to aggressively develop service, educational and informational web channels that extend the College's reach for the benefit of both the ESF community and the world, while at the same time ensuring the ongoing and future accessibility of ESF's growing digital assets.

In 2004-2005, The College implemented substantial visibility and marketing initiatives in New York State regarding ESF's Renewable Energy demonstration projects. On a larger scale, ESF's work in biomass derived projects such as the integrated biorefinery and the production of butanol and ethanol from lignocellulosics target national audiences through federal funding for research. The College hosted Department of Energy Secretary Steven Chu, Craig Ventor, Congressman Bass, two New York State senators and two former New York State governors to review the ESF's research and development work in the area of biofuels. Visible research initiatives include the integrated restoration of Onondaga Lake (jointly with NYDEC and Honeywell), commercial licensing of fast-growing willow by AA Vineyards for bio-fuel production, development of biodegradable plastics in conjunction with Blue Highway and Tessy Plastics, and the modeling of climate change effects on biological diversity.

As a means of increasing visibility in the local community, the College initiated the College Book Award, which is given to High School Juniors with a particular interest in the environment. Additionally, the Feinstone Environmental Award program has been substantially enhanced over the last five years. It is one of the oldest and most distinguished environmental award programs in the country.

The Feinstone Award dinner has become a premiere annual friend and fundraising event for the Foundation and the College, with attendance tripling since 2003. The Feinstone Awards program now yields net income of approximately $35,000-$40,000 per year, and often features nationally known speakers such as White House Science Advisor, John Holdren.

Goal 4: Become Financially Secure and Independent

As with all public institutions, in recent years ESF has had to increase fundraising from private sources because state support—as a percentage of the total College budget—has decreased. The president plays a key role in private fundraising by reaching out to alumni and other individuals, broadening ESF's partnerships with industry and increasing support from foundations.

State support will always be critical to ESF, however, and the College must continue to cultivate ESF's already strong relations with SUNY, the state Legislature, and the Governor. The College must also continue its excellent track record in attracting sponsored research funds.

Strengthening and diversifying ESF endowment funding

The ESF College Foundation is currently exceeding the pace required to reach the 2020 financial goal of $100 million in total assets. The current $20 million capital campaign is ahead of schedule to reach its target. Approximately $11.5 million has been raised during the quiet phase of the campaign. As the development program has grown and expanded, the Foundation has cultivated a broader base of donors including a larger number of corporate donors and "friends" of the college. The Foundation has also diversified its income stream through the construction of a 454-bed student residence and additional investment in income generating real estate donated from, and acquired by, the Foundation. The Real Properties program actively promotes donations of revenue generating properties being managed for sustainable timber production and employing state-of-the-art forestry management techniques. The Foundation has also secured properties that enhance College's academic programs, for instance, the expansion of Cranberry Lake Biological Station and the new field station in Costa Rica expand faculty and student research opportunities.

At the end of fiscal year 2002, Foundation assets totaled $8.1 million, compared to current total assets of $50 million. Total assets are 65% above the June 2011 annual asset goals set by the Foundation to track progress toward the $100 million target. Growth in assets can be attributed to increased fundraising activities including completion of the leadership phase of a $20 million capital campaign.

Foundation development efforts have resulted in the establishment of one endowed chair and two planned endowed professorships along with several new departmental endowments. Over $5.5 million in support for academic programs has been pledged during the leadership phase of the capital campaign. The College expects to achieve its goal of establishing eight endowed faculty chairs by 2020. Regarding student financial aid provided through the Foundation, the number of restricted endowed scholarships has grown from 71 in 2003 to 121 in 2011; a 98% increase. The College currently awards approximately $700,000 in scholarships provided by the ESF Foundation and alumni associations.

ESF's fundraising efforts are supported by a fully functioning web-based donation program, which has been in place for four years. In 2010 4% or 156 donations came through the College Development website.

SUNY administration is actively working to increase its licensing revenue relative to its overall research position (4th in the US). ESF is partnering with the technology transfer team at Binghamton University to establish patents more readily and bring licensing income to fruition more successfully. In April 2010, ESF, in conjunction with the Research Foundation for the State University of New York, hired Foresight Science and Technology to evaluate two pieces of technology relative to technology transfer. The Biotechnology Research Center, to be completed in 2013, will play a role as an incubator of some of ESF's new technologies, and the new Bio-fuels laboratory in Syracuse's Center of Excellence will provide a complementary and synergistic base for future licensing of intellectual property. By 2020, the College will seek a dozen patents annually with significant licensing income derived from 20% of these innovations.

Achieving research funding targets

ESF is actively increasing its research funding base in at least three ways: 1) The College has recently completed targeted hires of early-career but highly accomplished research faculty in the areas of sociology of science, biogeochemistry and climate change; 2) ESF has joined with three other campuses (SU, UMU, VA) to develop an environmental medicine initiative that targets federal funding from NIH; 3) The College is establishing

new research and funding connections with Upstate Freshwater Institute, Onondaga Environmental Institute and the Village of Minoa that will not only highlight some of the College's applied research but position ESF for enhanced funding opportunities. By 2020 the College will strive to have a research portfolio that exceeds $25 million. ESF is accelerating direct interactions with and support of the 32 Centers, Institutes, Consortia and Councils that spark innovation and research (Appendix 3). In 2011 ESF will launch three new centers in the areas of Cultural Preservation, Bio-processing, and Sustainable Materials and Manufacturing.

Goal 5: Strategically build and enhance partnerships and collaborative relationships

ESF's relationships with external organizations build upon and extend the College's strengths in service to local, state-wide, regional and broader communities of practice and scholarship. These mutually-beneficial collaborative endeavors are predicated on the strength and depth of ESF's academic, research, outreach, demonstration programs along with the College's long and abiding commitment to lead and support a shared commitment to improve the world.

The following are selected illustrative examples of ways in which ESF is pursuing and accomplishing the goal to *Strategically build and enhance partnerships and collaborative relationships*, as well as the steps to assess the impact and value of these accomplishments, and planned future initiatives.

Science and Policy

ESF is committed to being at the forefront of cutting-edge research; contributing to scientific advances that shape natural resource policy and legislation; and serving as a resource for elected officials, community leaders, and other decision makers. ESF fulfills this role by strategically establishing and maintaining strong partnerships in both science- and policy-related communities of practice.

ESF offers faculty-driven and faculty-partnered conferences, contract trainings, workshops and symposia designed to educate practitioners, elected officials, and policy makers on cutting-edge on and off-campus research that can inform and impact policy and regulation. Programs include:

- Sustainable Use or Renewable Energy (SURE)
- Central New York Biotechnology Symposium
- NYS Green Building Conference
- Green Infrastructure Symposium
- Short Rotation Woody Crop Conference
- Northeastern Recreational Research Symposium

All ESF Outreach programs employ online and in-person surveys for pre and post-program feedback in order to assess the value and direction of programs. Staff regularly consults advisory council members and faculty members with diverse backgrounds and experiences for program input and reflection. This interaction and collaboration allows ESF Outreach to develop, deliver, and grow its conferences and programming, resulting in rich professional programming that incorporates the latest advances in science and research.

In the future, the department plans to continue strengthening and expanding its programming to specifically address the emergent science needs of policy and decision makers. For example, ESF Outreach, in partnership with faculty from the Forestry and Natural Resources Management Department, received a USDA Higher Education Challenge grant that will provide support to develop a series of high-level case studies and intensive student internships in the field of short rotation biomass crops. These case studies and internships will add to the body of science-based and experiential knowledge needed to help shape policy and regulation within the growing field of bioenergy crops.

Program accomplishments were assessed according to metrics articulated in the US Forest Service Community Forestry grant proposal that provided a significant portion of the program's funding. These metrics included program completion rates, participant gains in content/skill areas, proportion of participants placed in internships and/or living wage jobs upon program completion, and duration of employment.

In the future, green infrastructure projects completed in the GLUE program could potentially be monitored to assess their effectiveness in capturing stormwater runoff, reducing the urban heat island effect, sequestering carbon, and other environmental benefits. Data would then be accessible to community leaders and policy makers for informed decision-making.

ESF faculty members are broadly engaged in scholarly activity. For example, Environmental Resources Engineering (ERE) faculty averaged 2.9 peer reviewed publications per faculty member last year, a product of the fact that increased scholarly output was a major goal of the last ERE strategic plan. The department plans to provide resources to continue to increasing scholarly output in the future.

The Environmental Studies department's Pack Foundation Small Grants program supports graduate student and faculty research that builds on other collaborations and partnerships to contribute effective and meaningful policy research.

The ESF library is a resource center for research materials for the campus and the community at large. A Faculty and Student Assessment was conducted in 2010-11 to evaluate the library's performance in this area. The results are currently being analyzed, and will inform future service efforts.

Economic Development

ESF leverages its scientific expertise through various professional programs, conferences, internship opportunities, centers, and outreach projects, in order to contribute to economic development in Central New York. The SAGE project (Sustainability and Green Entrepreneurship), one of several outreach programs created over the last few years, provides short courses and webinars to high school students. These courses typically involve local environmental entrepreneurs and other practitioners. Regularly administered participant surveys inform content development and the format of future program offerings.

- Several of ESF Outreach's professional education and non-credit programs focus heavily on supporting the economic development component of on-campus research. Two particularly strong examples are Sustainably Energizing New York's Creative Core, and the CNY Biotechnology Symposium. These and other professional programs include a diverse array of speakers that can provide insight into economic development. In addition, Outreach works with local economic development agencies including the Center State Corporation for Economic Opportunity and the NYS Department of Labor to assess the emerging employment and economic needs and growth areas throughout the region and the state.
- Future programming will continue to strengthen and bridge the science, policy, and economic development components of our on and off-campus research and collaborations. The USDA Higher Education Challenge initiative internship program places upper level undergraduate and graduate students in local and regional industry internships, thus supporting job growth in an emerging field.
- Participants in ESF Outreach's GLUE workforce training program were drawn from under and unemployed populations within the City of Syracuse. Upon program completion, graduates received ongoing assistance in finding living-wage "green" jobs in central NY, thus helping revitalize underserved communities in CNY. The program's curriculum includes work preparation and soft skills instruction (e.g. résumé writing, interviewing, workplace communication, etc.). The GLUE program was structured as follows:

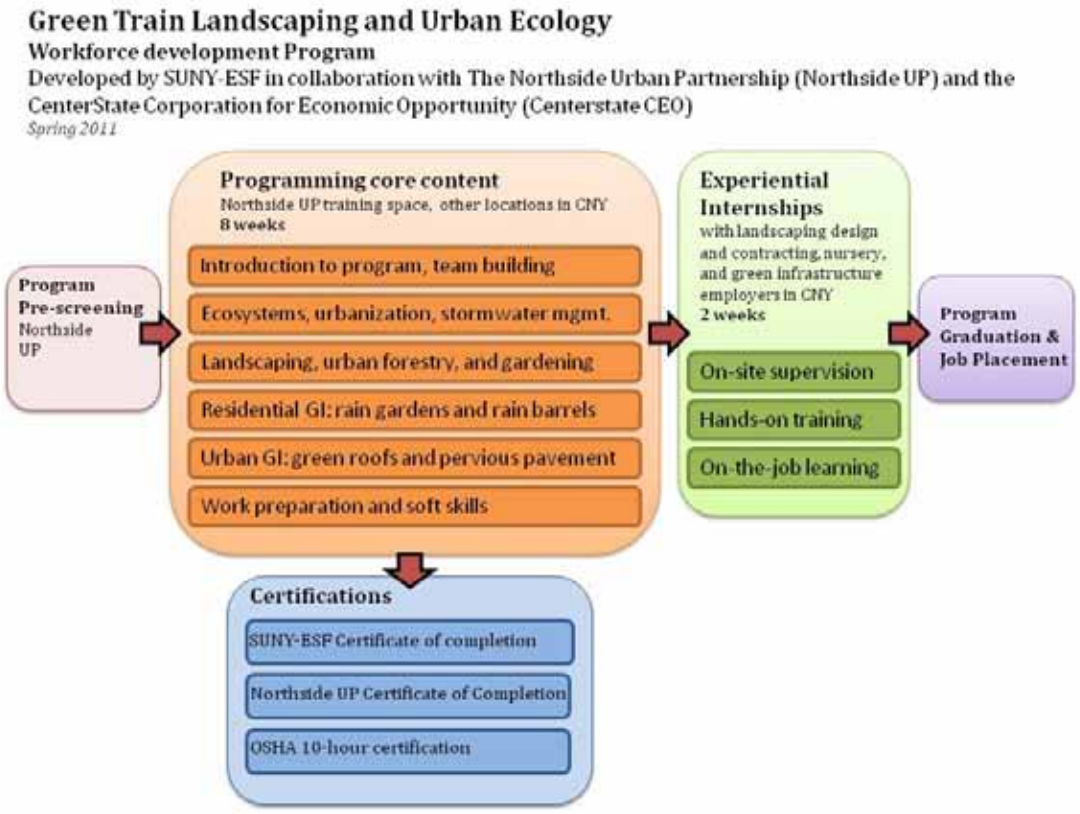


Figure 2. GLUE Training Program Framework

Examples of GLUE trainee job placements include:

- Ballantyne Gardens – Local garden center that also hosted GLUE interns.
- Environmental Paving Solutions – Paving Company pursuing opportunities in porous pavement and other permeable hardscaping.
- Sons of Erick Construction – Construction Company that specializes in weatherization and energy-efficiency.
- Home Headquarters – Not-for-profit group committed to creating housing and related opportunities to improve lives and revitalize communities.
- Catholic Charities – Not-for-profit group that seeks to "convene people around social issues and develop just responses." A graduate was hired to work on environmental and design projects.

The green job industry is expected to grow significantly in central NY over the next several years. Continued collaboration with recruiters and the formation of new relationships with potential employers will allow us to better connect trainees with emerging green jobs. Conversations are currently underway with local job providers and potential employers to establish a "green jobs bridge" that facilitates the training-to-workplace transition (as demonstrated in Figure 3).

Figure 3. GLUE Participants in the Field

Left to right: A) Dr. Ted Endreny, SUNY-ESF professor, instructs a GLUE participant in storm water calculations, reinforcing the basic math skills required for many landscaping, green infrastructure, and construction jobs. B) Two GLUE students practice designing a rain garden on-site. C) Participants use techniques learned in the classroom to select plants for a rain garden. D) GLUE students show off the porous paver patio, rain garden, tree plantings, and maintenance work they completed at McGroarty Park. This type of hands-on training prepares them for the type of work required in the landscaping and green infrastructure fields.

- The Environmental Resources Engineering and Landscape Architecture departments continue to support the Center for Brownfield Development, a SUNY Center dedicated to the evaluation and reclamation of brownfield properties to enhance community and economic revitalization.
- A portion of funding from the Environmental Studies department's Pack Foundation supports costs for research conducted in NYS, and many faculty are involved with research and outreach in NYS, including conducts research on Skaneateles Lake and the Onondaga Creek Partnership. These research efforts and their associated costs help support the local and regional economy.
- ESF students often participate in internships with local organizations. As a result, local companies, non-profits, and other organizations are able to use their limited resources more efficiently while also providing valuable educational experiences for students.
- The Office of Research Programs participates in collaborations with the Syracuse Center of Excellence in Environmental and Energy Systems to advance biofuels research and usage. It also partners with the CNY Biotechnology Research Center, and pursues the development of new industry-compatible centers such as the Institute for Sustainable Materials and Manufacturing. Future economic initiatives will include increased emphasis on licensing of intellectual property, and the development of new partnerships with private entities to help deploy expertise worldwide.
- ESF's Office of Student Life assists students and alumni with placement efforts within NY. A graduating student survey is administered each spring to assess post-graduation activities of undergraduate and graduate students. Approximately 70% of survey respondents indicated they began their careers in NY. Future efforts will continue to foster relationships with employers to assist with placement.
- The Office of Student Life's current employment network includes over 1,000 active organizations. This robust network of connections resulted in the largest career fair in ESF history in 2010, and has resulted in job placement of ESF graduates in environmentally-focused organizations throughout the region.

Partnerships

ESF faculty members in various departments continue to strengthen collaborative efforts with other SUNY and private institutions and organizations. These strategic synergies are vital to the advancement of the College's mission and the success of many of its programs.

The College has dozens of Memorandums of Understanding with federal, state, local, private, and non-profit organizations and universities.

Academic Partnerships

New international partnerships focused on education have been formed with several international institutions, including:

- Sichuan University, Chengdu, China: Sichuan University has a comprehensive range of disciplines covering 11 categories, namely, liberal arts, science, engineering, medicine, economy, management, law, history, philosophy, agriculture and education. It consists of 30 colleges, and has made remarkable achievements in science and research. ESF partners with the university to offer a semester exchange program for students.
- Munich Institute of Applied Science, Munich, Germany: ESF partners with the institute to offer a semester exchange program for students.
- Beijing University of Chemical Technology, Beijing, China:: Faculty from the university sat on the advisory and scientific committees for the International Conference on Biorefinery hosted by ESF in 2009.

In addition, new international partnerships focused on research have been formed with several other international institutions, including:

- Instituto de Ecología, Mexico: The departments of Environmental and Forest Biology, Forest and Natural Resources Management, and Environmental Resources Engineering are collaborating with the Instituto de Ecología to address urgent conservation issues related to mountain cloud forests in Mexico, and to discuss strategies to protect the many species of concern in these endangered communities.
- Fundación Neotrópica, Costa Rica: ESF recently partnered with the Fundación Neotrópica, a Costa Rica-based not-for-profit organization, to establish a Center for Education and Community Empowerment at the college's tropical field station. The new center will provide experiential, field-based education; serve as a base for ESF researchers and students in Latin America; and eventually have the capacity to host up to 20 people year-round. The Fundación Neotrópica will be involved in the management and development of the college's Sundt Field Station, and will be responsible for oversight and significant programming that will result in community involvement in education, demonstration and research (http://www.esf.edu/communications/view.asp?newsID=845).
- Upstate Medical University (UMU): In addition to training students for admission to medical school, ESF has several joint programs with the SUNY Upstate Medical University (UMU) that offer ESF students unique opportunities for early and/or guaranteed admission to one of seven bachelor's degree programs at UMU:
  - Cardiovascular Perfusion
  - Cytotechnology
  - Medical Imaging Sciences
  - Medical Technology
  - Physical Therapy
  - Radiation Therapy
  - Respiratory Care

ESF and UMU are also developing an Environmental Health Initiative

- Upstate Freshwater Institute: ESF's long-standing professional connection with Upstate Fresh water Institute(http://upstatefreshwater.org/) is being formalized with a unique MOU and partnership that will provide additional synergies and cost savings for both institutions.
- Binghamton University: ESF partners with Binghamton University for administrative support of Technology Transfer and Patents.
- Syracuse University Center of Excellence: ESF is a founding partner with the Syracuse Center of Excellence in Environmental and Energy Innovations Systems, which was initiated in 1996 it received New York State legislative support, and was supportive of the blueprint for regional economic development

that was prepared by the Metropolitan Development Association (MDA) of Syracuse and Central New York. The MDA plan identified "environmental systems, equipment, and services" as one of seven industry "clusters" in the region.

Most faculty are members of professional societies (e.g., Ecological Society of America, American Society of Landscape Architects, Association for Environmental Studies and Sciences, Ecological Engineering, Society of American Foresters). Faculty also directly collaborate with faculty at other institutions including Syracuse University, the Department of Veterans Administration, Upstate Medical University, Brookhaven National Laboratory, and the Syracuse Center of Excellence, to name a few. Future collaborations with large universities and centers including SUNY Binghamton, Pennsylvania State University, University of Michigan, Oregon State University, and others are pending.

The ESF library partners with other libraries via the SUNY Council of Library Directors. It participates in the Syracuse University Bird Library IDS program run by SUNY Geneseo, and maintains other partnerships and cooperative activities both regionally and nationally.

Student Life staff members participate in SUNY-wide meetings of chief student affairs officers and career development staff members. Similar SUNY-wide meetings of business officers, chief academic officers, enrollment management and admissions officers provide important forums for collaboration and partnership development.

Federal Government Partnerships

Research supported through cooperative agreements with Federal Government Agencies include:

- National Endowment for the Arts – Work on Your Town: Citizens Institute for Rural Design
- National Park Service – Develop Cultural Landscape Report for Eleanor Roosevelt National Historic Site, Advise on the Development of General Management Plan for Roosevelt-Vanderbilt National Historic Site, Provide Technical Assistance for Cultural Landscapes in National Parks Research and Evaluation of Marin Headlands Cultural Landscape and the Golden Gate National Recreation Area, and Develop Forest Stewardship Plan for Roosevelt - Vanderbilt National Historic Sites
- US Geological Survey – Research Support for the Restoration of Great Lakes Fish Communities, Near Shore Ecology of Grand Canyon Fish
- U.S. Forest Service – Fungal Biodiversity and Community Dynamics in the Oregon Coastal Dune Ecosystem, Investigate Urban Forest Structure and its Effect on Environmental Quality

Additional Partnerships

In addition, cooperative agreements with Non-Federal Organizations include:

- American Forest Management Incorporated – examining willow biomass yield in South Carolina
- Antek Incorporated – Hydrogen storage research
- Antique Boat Museum – Boat Building Curriculum at 1000 Islands Biological Station
- City of Utica – Project Development, Implementation and Funding of Context Sensitive Transportation Improvements and Related Activities at Utica Marsh
- Great Lakes Research Consortium – Collaborative research on the Great Lakes amongst 18 New York colleges and Universities and 9 affiliates in Ontario.
- Institute of Forest Biotechnology – Transformation of American Chestnut with Genes Encoding Transcription Factors
- Lewis County Development Corporation – Redevelopment of Lyons Falls Pulp and Paper Site
- Massachusetts Department of Fish and Game – Assessment of the Effects of Habitat Restoration on Bog Turtle Populations in Massachusetts
- National Fish and Wildlife Foundation – Development of Fish Habitat Conservation Strategy

- The Nature Conservancy – Development of a Field Guide to the Common Mosses of New York State, Inventory and Analysis of Vegetation in Remnant Inland Salt Marshes of New York, Monograph of Hydrozetes (Acari: Oribatida) and Computerized Key to Aquatic Oribatid Mites of NY, Habitat Mgmt for Conservation of Inland Barrens Buck Moth in Albany Pine Bush, Assessment of Residential Developmental Impact on the Integrity of Mammal Communities in the Adirondack Park, Mercury Accumulation and Food Web Magnification in Two Forest Dwelling Songbirds of NY Upland Forests and investigating Wood-Inhabiting Micofungi-Mold of New York
- Wyeth Pharmaceuticles – Pneumococcal Polysaccharide Capsule Examination Using Transmission Electron Microscopy
- Central New York Land Management LLC – Availability of Marginal Land and Economics of Scale in the Production of Non-Traditional Energy Crops
- New York City Dept of Environmental Protection – COE in Watershed Applications & Technology-Biomass Gasification Project
- NY Water Environment Association Inc. - Cooperative Program of Research Studies and Continuing Education for the Water Environment of NYS
- New York Forest Owners Association - Promoting NIPF as a Future Woody Bioenergy Feedstock
- The Consortium for Plant Biotechnology Research Inc. - Field Testing Blight Resistance in the First Transgenic Line of American Chestnut Trees

ESF Contracts with State Agencies

On-going research contracts exist with several New York State agencies including:

- New York Power Authority – Muskellunge Genetic Structure, Reproductive Ecology, and Interaction with the Fish Community, Powerline Vegetation Management in New York,
- NYS Department of Agriculture and Markets – New York State Fairgrounds Green Infrastrucolonnade and Restaurant Row
- NYS Department of Environmental Conservation – Conservation Easement Planning and Stewardship Specialists, Northern Forest Institute for Conservation Education and Leadership Training, Hudson River American Shad Recovery Program, Northern Forest Conservation Education and Leadership Training Institute, Assessment of Lake Sturgeon Stocking in the Oswego Basin, Application of GIS Resource Inventory for Unit Management Planning
- NYS Education Department – SUNY-ESF Collegiate Science and Technology Entry Program (CSTEP)
- NYS Energy Research and Development Authority
    - Advanced Training Workshops in Alternative Energy
    - Assessing the Viability of Radar and Acoustic Data as a Predictor of Collision Risk to night Migrating Birds and Bats: A Test Using Data from the Maple Ridge Wind Power Project, Lewis County, NY
    - Evaluation and Protection of Adirondack Ecosystems: Impacts of Acid and Mercury Deposition on Watersheds
    - SUNY-ESF Gateway Combine Heat and Power System
    - Enhance NYS Ability to Produce Biomass: Land Restoration
- NYS Office of Science Technology and Academic Research - Accelerated Commercialization and Expansion of Short Rotation Woody Biomass Energy Crops in New York State

Federal extramural program sponsor partnerships

Federal sponsors of extramural programs at the institution include partnerships with:

- The Environmental Protection Agency – contribute fellowship support for students and work on the Onondaga Creek Habitat Restoration

- NASA Marshall Space Flight Center - Phytoremediation Laboratory Services to Support Hyperspectral Imaging Studies
- The National Science Foundation, - Land-Use Changes in the Amazon and Indigenous peoples, Salamander research. Fundamental Physical and Chemical Investigations of Electron-Beam Plasmas Isotope, Effects in Methoxy Radical Chemistry, Marine Zooplankton Growth and Reproduction, the relationship between carbon allocation to fungi, Ecophysiology of DMSP and related compounds and their contributions to carbon and sulfur dynamics in Phaeocystis in Antarctica, Summer Science Camp for Native American Youth: Finding Common Ground between Scientific Ecology and Traditional Ecological Knowledge, Positioning Rust-Belt Cities for a Sustainable Future, Winter Climate Change in a Northern Hardwood and Protein and Metabolic Engineering for the Production of Biodegradable Plastics

Additional partnerships with federal sponsors include:

- The National Fish and Wildlife Foundation
- The Nature Conservancy
- NASA Goddard Space Flight Center
- NOAA
- NOAA Estuarine Reserves Division
- Small Business Administration
- US Army Research Development and Engineering Command
- US Department of Education,
- US Department of Energy
- US Fish and Wildlife Service
- USDA Animal and Plant Health Inspection Service
- US Cooperative State Research Service
- USDA Northeastern States Research Cooperative
- USDA Rural Development

Business Partnerships

The College maintains business partnerships with many multi-national corporations, including:

- IBM – ESF is working to install IBM's building management system to monitor and control energy integration in the Gateway Building. The College is working to establish an internship program for ESF students in the area of sustainability.
- Welch Allyn/Blue Highway – funded research to develop biopolymers for medical device applications.
- Bristol Myers Squib – an ESF fourth year Landscape Architecture studio developed ideas for sustainable post-demolition strategies at the North Plant. BMS funds a minority undergraduate scholarship at ESF, and has donated analytical instrumentation to ESF's Chemistry Department.
- C&S Engineers – ESF and C&S were jointly honored with a Silver Award in 2007 for Engineering Excellence by the American Council of Engineering Companies of New York, for the citing and design of a unique combined heat and power system.
- Anheuser-Busch Inc. – ESF provided consulting guidance on a wood-fueled combined heat and power facility, and ESF also advised AB on the appropriate disposal and reuse of the wood chips generated by AB; Anheuser-Busch contributes to the ESF Foundation.
- Stickley Furniture – served as a beta site for the launch of a new institution line of furniture; Stickley provided a major naming gift for the Gateway Building.
- O'Brien & Gere – ESF partnered with O'Brien & Gere and Sensis Corp in the establishment of Source Sentinel through the SUNY Research Foundation; ESF partnered with O'Brien & Gere to deliver a Sustainability Management short course; and the company provided a significant gift to the ESF College Foundation.

- CRC – ESF partnered with CRC to acquire a $10 million NYSERDA grant to develop a 10-ton-per-day pilot plant to support the integrated biorefinery initiative
- Siemens Corporation – ESF partnered with Siemens to conduct a survey of available biomass within a 25-mile radius of Syracuse to support a potential woody-biomass fueled combined heat and power facility in the Syracuse area.
- Honeywell – ESF has supported Honeywell in the restoration of 800 acres of wastebeds in the town of Camillus through the demonstration of a vegetative cap; support for the establishment of native plants and vegetation along the shoreline of Onondaga Lake; and through mutual support of environmental programming to youth and teachers in Central New York. The ESF College Foundation also received a gift from Honeywell.
- International Pape – ESF provided support to the Ticonderoga Mill to conduct the technical and economic analysis to implement a cellulosic biomass-based sugar extraction system; International Paper has donated paper art and provided support for the Syracuse Pulp and Paper Foundation.
- Syracuse Research Corporation (SRC) – developed an ESF faculty/research group to support the SRC Innovations Group; SRC provided substantial financial support for the ESF Centennial Campaign.
- National Grid – National Grid supported the installation of a combined heat and power system in the College residence; National Grid provided support in ESF's pursuit of numerous energy-related research and demonstration projects, as well as many of ESF's conferences and short courses.
- Solar Liberty – provided 75 KW of solar photovoltaic systems to ESF for application in three locations.

Advisory Groups

Regular internal assessment and reflection by ESF offices and departments is complemented by input from advisory councils, which are established in order to provide additional, external perspective on programmatic and departmental strengths, weaknesses, and opportunities. ESF continually seeks new members for various advisory councils who will provide ongoing and novel perspectives in their fields.

- Much of ESF's educational programming is predicated on partnerships that are realized in the form of participation on advisory councils, sponsorship of events, speaking roles in various programs, and attendance of programs. For example, an advisory council of Central New York professionals in fields related to landscaping and sustainability was assembled to provide guidance in developing and implementing the GLUE workforce training program, and will be consulted about future program modifications. Programs with particularly strong and diverse partnerships include:
    - Leading Sustainability in Public, Private and non-profit organizations
    - Green Train Landscaping and Urban Ecology (GLUE) program
    - USDA Higher Education Challenge Initiative
    - From Farm and Forest to Fuel program
    - Short Rotation Woody Crops Working Group Conference
- External advisory councils and steering committees are well established for the following ESF Outreach programs:
    - CNY Biotechnology Symposium
    - Green Infrastructure Symposium
    - Leading Sustainability in Public, Private, and Nonprofit Organizations
    - NYS Geographic Information Systems (GIS) Conference
    - NYS Green Building Conference
    - Northeastern Recreation Research Symposium (NERR)
    - Short Rotation Woody Crops Working Group Conference
    - GLUE workforce training program

- Many of ESF's academic departments have formally established advisory councils, including: Landscape Architecture, Sustainable Construction Management and Engineering, Paper and Bioprocess Engineering, and Environmental Resources Engineering. Other departments have recently invigorated their advisory boards as part of their strategic plans. For example, the Environmental Resources Engineering department's board has recently increased its involvement in the department and plans to be play an active role in future assessment efforts, employment aid, panel discussions, and departmental development.
- An advisory council of Central New York professionals in fields related to landscaping and sustainability was assembled to provide guidance in developing and implementing the GLUE workforce training program, and will be consulted about future program modifications.
- New advisory boards are being developed for the Institute for Sustainable Materials and Manufacturing, and are strongly encouraged for each new center or institute that is established.

ESF intends to continually seek new members for various advisory councils who will provide ongoing and novel perspectives in their fields.

Industry Outreach and Non-Traditional Students

ESF's mission entails a commitment to enrich the education and professional practice of individuals and organizations that share the college's commitment to improving our world. In keeping with this mission, ESF seeks to offer strong and diverse continuing education programming opportunities that link non-traditional students, professional audiences, and industry leaders.

- ESF's Green Train Landscape Urban Ecology (GLUE) workforce training program targets exclusively non-traditional students drawn from underserved populations with barriers to employment. Participants in GLUE included 16 refugees and 10 United States citizens with barriers to employment (criminal backgrounds, no high school diploma, etc.). The program was successful, in large part, due to effective partnerships with private and nonprofit institutions such as the Near Westside Initiative (assisted with project selection/implementation and various other items), the Northside Urban Partnership and Centerstate Corporation for Economic Opportunity (supported participant recruitment, case management, and job placement), and CNY Works (supported recruitment and job placement). GLUE worked with at least 12 private and nonprofit partners, including those previously listed as well as the Westside Learning Center, La Liga, Huntington Family Center, St. Lucy's Parish, Home Headquarters, Nojaim's Market, jobsPLUS!, and the Refugee Assistance Program. ESF will continue to collaborate with these and additional partners to seek out future training program opportunities, identify project sites, and recruit program participants.
- The Office of Research Programs has established research linkages and financial relationships with Upstate Freshwater Institute and the Onondaga Environmental Institute, and is developing a new entity to include Minoa, ESF, and a private firm.
- ESF links productively and programmatically with large energy companies such as SUNOCO, the County of Oswego, Honeywell Corporation, and others. The college anticipates even stronger partnerships with these organizations in coming years.
- Paper and Bioprocess Engineering (PBE) has a strong and long-standing relationship with the paper industry through the Syracuse Pulp and Paper Foundation, Espri, and PBE alumni.
- ESF collaborates with a variety of business, industry, and trade organizations including Partners Education and Business, Partnership for Better Education, CNY Works (an area workforce investment board), Centerstate CEO, the Manufacturers Association of Central New York, and CNY Works.

ESF established ESF Online (2008) to offer credit courses to non-matriculated (i.e. non-degree) students. In only its fourth semester, ESF Online has enrolled students from Michigan, North Carolina, South Carolina, Massachusetts, Connecticut, Wisconsin, Virginia, and throughout New York State.

- In its first year following the pilot effort, ESF's Summer Session consisted of 14 course offerings that enrolled 139 students, 42% of which were non-matriculated students. This impressive headcount is due in part to successful outreach efforts through a variety of outlets, such as:
    - ESF and ESF Outreach Webpages
    - Summer Spotlight Instructor Videos
    - E-mails to Campus News and Student listservs
    - Fliers on ESF, Lemoyne and OCC campuses
    - Social Media (Facebook, YouTube, Outreach blog, and E-news)
- Much of the ESF professional education and non-credit programming is geared (both in content and format) towards professional communities of practice (most notably professional engineers, registered architects, and registered landscape architects). Representative examples include the NYS Green Building Conference, the CNY Biotechnology Research Symposium, the NYS Geographical Information Systems, and others. In addition, the Solar Power as Renewable Energy (SPARE) program offers basic (4-day) and advanced (2-day) training opportunities in solar power site assessment, system scaling, installation and maintenance. This program employs both in-person and online educational methods to reach a diverse and non-traditional university audience. The professional audiences served by these programs exemplify a connection between non-traditional students and industry. End-of-course evaluations and enrollment data will be used to continue to strengthen credit and non-credit programming, including the use of learner-centered formats and learning technologies.
- The Certificate of Advanced Study in Bioprocessing, offered through ESF Outreach and the Environmental Resources Engineering department, is a graduate-level program tailored for professionals with full-time jobs. Participants complete the program in 10 months strengthening their knowledge and skills with minimal interruption to their lives and work. The Bioprocessing certificate program fulfilled all ESF faculty, SUNY and New York State Education Department review standards. Ongoing participant and faculty feedback (formal and informal) inform program content and direction.
- ESF employs new technologies and educational program methodology such as webinars to reach out to non-traditional and diverse audiences throughout the region. Plans are in place to expand the use of new program technologies and delivery methods to reach out to diverse audiences throughout the region.
- ESF continues to develop continuing educational programming for traditional and non-traditional students through emerging employment opportunities. Currently, ESF Outreach is working to submit an H1B grant to expand non-traditional student continuing education opportunities.
- The Department of Sustainable Construction Management and Engineering is pursuing initiatives to develop short courses offered to non-traditional students.

The College seeks to continue strengthening and growing partnerships to better serve communities of interest in future years.

Goal 6: Respond to the needs of society

Community outreach, in its many forms, is integral to the College's mission. ESF faculty, staff and students, along with our partners, pursue a range of programs and projects that build upon ESF's academic and research expertise. ESF's Outreach Office supports partnerships and collaborations and provides planning, marketing, management, and evaluation support to faculty-driven and faculty-partnered initiatives.

In 2001, ESF renewed and strengthened its commitment to outreach. Collaborations were initiated with schools, colleges and universities, economic and workforce development organizations, and other public,

private, and non-profit organizations. As a result, ESF serves and partners with more people and organizations through a broader array of programs and projects than ever before.

ESF Outreach, through the Associate Provost for Outreach, provides institutional leadership, consolidates educational outreach activity throughout the Academic Affairs division of the College, and coordinates outreach advancement. Representatives from constituent organizations comprise the several advisory councils that inform program strategy.

ESF Outreach links the College with partners and constituents outside the academic community, serving professionals; middle school, high school, and college/university educators; and middle school, high school, college/university, adult, and lifelong learners – all with an aim to enhance education, leadership and practice in the science, design, engineering, and management of natural resources and the environment.

The following are selected illustrative examples of ways in which the College is pursuing and accomplishing the goal to *respond to the needs of society.*

Business Approaches

ESF is committed to providing business incubation opportunities on campus and infusing entrepreneurship into the college's culture. It pursues these objectives through a variety of means:

- ESF has been a full and active partner in a regional Kauffman Foundation-funded entrepreneurial initiative led by Syracuse University (in partnership with Cayuga Community College, Onondaga Community College, Lemoyne College, and SUNY Morrisville). Several grant projects resulted in new courses (for example, Climate Change and Non-profit Organizations), the SAGE Project, and the infusion of entrepreneurship into existing courses. Efforts are underway to sustain new programming and to secure external funding where necessary.
- ESF is a partner in a new e200 U.S. Small Business Administration (SBA) grant to stimulate the growth of urban businesses, including environmental businesses, through an intensive six month national training program. Related specifically to this partnership, ESF will host the graduation event on campus for the 18 participating businesses.
- ESF's GLUE workforce training program prepared students to enter an emerging green infrastructure industry that is pioneering many new stormwater management technologies. Instructors and speakers discussed their business development experiences and current business practices. Future program iterations could potentially emphasize entrepreneurship by incorporating a brief "introduction to entrepreneurship" module into the training curriculum.
- ESF, through grant funding and other efforts, has established a new "Introduction to Green Entrepreneurship" course for qualified high school students throughout New York State. Efforts are underway to sustain programming and to secure external funding where necessary.
- Efforts by the Office of Research Programs are helping to clarify the relationship between intellectual property (patents) and entrepreneurial opportunity. New faculty hires include individuals who are experienced in industry. The Office of Research Programs plans to continue working productively with the experts at SUNY Binghamton in both intellectual property and licensing as well as in entrepreneurial ventures.
- The CNY Biotechnology Research Center is being formed jointly with SUNY-ESF and Upstate Medical University to create an incubation environment. Construction of the facility will be completed in 2012.
- The CNY Biotechnology Symposium's mission is to bring together industry representatives and scientists, academics and students, and other professionals interested in biotechnology in order to develop synergies and relationships that further advance the field. In addition, the symposium seeks to stimulate interest in the CNY Biotechnology Research Center.
- SUNY-ESF utilizes a biofuels research and development space in the Syracuse Center of Excellence building that facilitates incubation opportunities in the biofuels field.

- In the future, distant campuses such as LaFayette Experiment Station could potentially provide space for incubation opportunities such as experimental production and sales of willows and other plants with biofuels promise. Incubation opportunity could also be created by connecting big business capital with greenhouse production and experimental facilities.

Outreach

ESF strives to serve the community by providing continuing education and preeminent curricular materials for K-12 science teachers, offering challenging and relevant educational opportunities to K-12 students, and engaging in outreach to community members. ESF's outreach efforts have been strengthened and expanded considerably over the last several years. Efforts have included formalization of advisory councils to inform programming; acquisition of a web-based password-protected reservation system; internal controls procedures; programming for middle and high school students and educators as well as matriculated and visiting students and professionals; and the acquisition of grants (as lead agency and as subcontractor) to support new and ongoing programmatic activity.

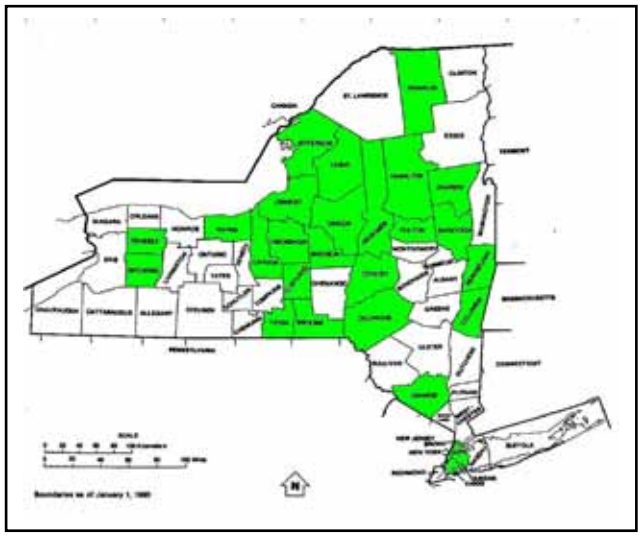


Figure 4. Counties highlighted in green contain school districts that participate in ESF in the High School

Efforts have also utilized learning technologies in both synchronous and asynchronous formats in order to accommodate participants and cost-effectively reach as geographically broad a service area as appropriate and possible. For example, in the last few years ESF has integrated online content delivery into its course offerings by using the Blackboard course management system for credit courses; webinars for credit and non-credit programming for students and professionals; and "blended" or hybrid approaches that combine face-to-face and distance-learning approaches.

The college has "branded" ESF's outreach efforts under the comprehensive, recognizable banner of "ESF Outreach," and has developed several branded programs such as ESF in the High School, ESF SCIENCE, the ESF Science Corps, SAGE, ESF Online, the NYS Green Building Conference, and The Biotechnology Symposium: Cultivating Economic Growth.

These efforts have been undertaken in collaboration with economic development, workforce, K-12, and college and university partners, as well as other public, private, and non-profit organizations. One example is a recent USDA Higher Education Challenge grant, which was secured with the Center State Corporation for Economic Opportunity and the Syracuse Center for Excellence as full (cost-sharing) partners.

The College's ESF in the High School program began in 1999 with a single high school partnership, which grew to three schools in 2000, and to thirteen schools in 2003. This year, ESF in the High School partnerships expanded to include 45 active high school partners representing 41 school districts located in 25 counties (Figure 4; 40% of New York State's 62 counties).

Noteworthy within the ESF in the High School program is a strong relationship with the Syracuse City School District (one of New York State's "Big Five" urban school districts) that entails collaborative grant programs (e.g., New York State Education Department Smart Scholars Program), ESF in the High School courses, and cognate programs such as the Environmental Challenge and Environmental Summit. Other significant partnerships include the Rome City School District and the New York City High School for Environmental Studies.

In the fall 2010 semester, ESF undergraduate enrollment included 1,586 full time and 587 part time students.ESF in the High School headcount enrollment represented approximately 25% of these 2,173 students. In the future, ESF Outreach aims to grow ESF in the High School enrollment to 1,000 students with partnerships in New York

State as well as in other states. To do so, Outreach will expand its repertoire of courses and employ distance learning approaches (e.g., Blackboard, webinars) for course delivery and teacher professional development.

Several new ESF in the High School courses were piloted this year at the Syracuse City School District's Institute of Technology at Syracuse Central with support from a New York State Education Department Smart Scholars Program grant. These included Urban Planning and Design (Prof. Emanuel Carter, mentor), Renewable Energy (Dr. Neal Abrams, mentor), and Biophysical Economics (Dr. Charles Hall, Whitney Lash Marshall (Ph.D. student), mentors). Approaches entailed traditional ESF in the High School in-school and teacher-delivered models along with new models that brought Syracuse City School District students to campus to take courses. Furthermore, ESF Outreach has established ESF SCIENCE (Summer Camps Investigating Ecology in Neighborhood and City Environments); the Environmental Challenge middle school science fair (600 students); and the Environmental Summit high school research symposium (150 students).

As one of ESF's centers, ESF in the High School has served as the foundation for numerous grants, including $3 million in National Science Foundation funding that provided over $1.5 million in research support for 52 ESF Masters and Ph.D. students, as well as cost of education support of over $500,000. NSF funding enabled graduate student professional development in leadership, communication, and the integration of research and teaching.

Specific program and course-level assessments are conducted through end-of-course and end-of-program surveys. Additional larger-scale assessments of outreach activities consider the number and nature of students, educators, citizens, and professionals served; the external funding brought to the campus and community; and the opportunities created by effective partnerships.

Examples of ESF's commitment to outreach include:

- ESF Outreach provided subsidized courses to teachers through ESF Online, and established a series of summer institutes for teachers that focused on environmental science and alternative energy. In addition, Outreach provided faculty-led workshops at the Science Teachers' Association Annual Conference (STANYS), and collaborated with the Syracuse City School District on a Math, Science Partnership (MSP) project to enhance science professional development for elementary teachers. Outreach also offered triennial ESF in the High School Professional Development Days. The success and relevancy of these programs were assessed through course evaluation forms and teacher focus groups.
- ESF Outreach collaborated with local partners to take the lead on the development of high school and middle school educational outreach programs focused on green infrastructure, sustainable storm water management, and urban design. These initiatives were pursued in concert with partners to support local and regional efforts in green infrastructure awareness and outreach. Programs continue to reach students and teachers through in-class educational programming and activities, teacher professional development training, and the infusion of educational modules into summer science camps for middle and high school students.
- The Environmental Studies department's writing program is integrally involved with the ESF in the High School program and offers college-level writing courses to qualified high school students.
- The library supports ESF in the High School programming, other outreach projects, and the Environmental Challenge (an environmentally-focused science fair and career exploration opportunity for Syracuse City middle school students).
- In 2011, the Environmental Challenge brought together more than 600 middle school students from 11 schools in the Syracuse City School District. Students presented over 300 science projects on topics ranging from liquid density to chemical reactions to the cultivation of molds and fungi.

- The 2011 Environmental Summit provided an opportunity for ESF to serve high school teachers and students in the ESF in the High School program. This year's summit brought together 160 students from 12 schools throughout Central New York to present their year-long research projects. Students received guidance from their teachers and support from ESF faculty and staff as they designed, conducted, and presented their research. One student who participated commented that "bringing all these people together makes me feel like I'm part of a bigger scientific community."
- Various Paper and Bioprocess Engineering faculty contribute to elementary, middle, and high school outreach efforts. For example, Mr. Burry works with the Boy Scouts for their Pulp and Paper badges, and Dr. Scott presents at high schools and other venues.

The College will continue to collaborate with campus community members and regional partners to strengthen its existing outreach programs, develop new initiatives to reach additional audiences, and deliver innovative content that aligns with ESF's ongoing and proposed research endeavors.

Programs

ESF's educational programs continually evolve to serve the emerging needs of society in terms of both content and delivery methods. Research conducted at the college often engages in major national and international environmental issues, and courses offered to both traditional and non-traditional students strive to focus on relevant, emerging issues. New programs are continually developed as new technologies and scientific advances emerge, and existing programs are reconfigured to be offered via a variety of instruction methods including online course delivery. In addition, academic programs are structured to include community service as a significant part of the curriculum in order to serve society's needs and make a meaningful contribution to the community.

- Several ESF Outreach programs are "hybrid" programs that combine online and in-person instruction, and some programs (e.g. Leading Sustainability in Public, Private, and Nonprofit Organizations; and Solar Power as Renewable Energy) are evolving to be completely online in order to reach larger and more diverse audiences.
- ESF Outreach's GLUE workforce development program was implemented in two different areas of Syracuse in order to maximize accessibility to the target audience. As a result, communities with the most need benefited from high visibility beautification projects and infrastructure.

For example, a vacant lot was transformed through a partnership with Syracuse's Newar Westside Initiative (NWI). Students designed and installed a rain garden to capture water from the roof of a Habitat for Humanity house, and designed and installed additional landscaping for the home owner (Figure 5) Content, delivery method, and location of future programs will be adjusted based on the evaluation of previous programs and the guidance of an advisory council.

Before *After* *After*

Figure 5. Green Train Landscape Urban Ecology (GLUE) Program Project

- Academic departments continually assess undergraduate and graduate curricula, and regularly update them to address society's current needs.
- The department of Environmental Studies launched its Master of Professional Studies and Master of Science degree programs in 2008.

- The Sustainable Construction Management and Engineering (SCME) department recently made revisions to the Construction Management curriculum and added courses in sustainable construction. Several assessment activities provided input to the curriculum changes, including department strategic planning in 2006-07, senior exit interviews, alumni questionnaires, and advice from former students' employers and the SCME advisory board.
- Prior to 2008, the Student Life department was comprised of 3 staff people. As student needs have evolved and expanded, ESF has responded to meet these needs. Additional positions have been added, including a Career Development Officer (2008) and a Community Service and Service-Learning Coordinator (2010). There are now 6 professional staff members and 1.5 classified staff members within Student Life.

Student Life conducted an employer survey in 2011 to assess current hiring practices of the employers with which ESF students most interact. The office will evaluate the data gathered by these surveys, and will continue to identify and build upon relationships with employers and community-based organizations to ensure that ESF students are able to connect with them during and after their time at ESF. In addition, the office will continue to conduct employer surveys (and other applicable assessment methods) to ensure that it is meeting the needs of stakeholders.

- The paper engineering program (Paper and Bioprocess Engineering department) was revised to reduce the required credit load and increase flexibility within the program. This revised program will better meet industry needs and will be more comparable to competitors' chemical engineering programs.
- The Library is open to the community at large for guest access to its many resources.
- ESF Outreach established two National Science Foundation GK12 projects for graduate students. Outreach also developed seminar and the ESF Science Corps to allow ESF graduate and undergraduate students to assist in ESF Outreach activities. The efficacy of these opportunities is evaluated by graduate student surveys and end-of-course surveys.
- Extensive community activities are incorporated into the Environmental Resources Engineering department's senior capstone and ecological engineering courses.
- Service learning is an important part of ESF's culture. The Student Life office has increased its commitment to community service/service learning by hiring a full-time staff member (2010) to provide oversight to this area. Virtually every department offers courses that incorporate service learning into their curricula, reflecting a campus-wide commitment to service learning.

ESF Outreach's educational offerings, including professional education and non-credit programs, K-12 outreach, and other initiatives, seek to engage participants in the regional application of larger national and international environmental issues through our collaborative efforts with on- and off- campus partners.

- Projects completed as part of the GLUE workforce training program contribute to sustainable urban design, water conservation, carbon sequestration, and the reduction of Syracuse's carbon footprint. Future curricula could potentially increase emphasis on the role of green infrastructure in ameliorating larger environmental problems (e.g. global climate change) in addition to reducing combined sewer overflows.

The Division of Environmental Science recently reorganized in order to create a nucleus for new interdepartmental and interdisciplinary education, research, and collaboration. The Division draws upon faculty from across many departments of the college in order to emphasize a multidisciplinary approach to environmental understanding, problem solving, and stewardship. It maintains a strong academic orientation and facilitates student and faculty engagement of fundamental environmental challenges such as resource utilization and sustainability, the uses and limits of scientific prediction and risk analysis, and a holistic concern for the health of the environment. Several new programs are being developed through the Division of Environmental Science. These include:

  - Environmental health
  - Biophysical and ecological economics
  - Restoration ecology
  - Renewable energy management

- ESF's Ranger School offers an A.A.S. degree in Environmental and Natural Resources Conservation. The program employs a "one-plus-one" plan that requires students to complete 30 credit hours of coursework in liberal arts and science at an accredited colleges and universities, followed by an additional 45 credit hours at the Wanakena campus during the second year of the program. The program provides students with the scientific theory and applied skills necessary for a technical career in the environmental and natural resources sector, and includes technical training in plant and tree identification, land surveying, natural resources measurements, geospatial applications, soil and water monitoring, wildlife techniques, and forest recreation. All classes are taught at The Ranger School, which houses the classrooms, library and computer lab, in addition to student residence facilities. The

Ranger School's 2,800-acre forest provides an excellent outdoor laboratory for fieldwork and hands-on learning. The knowledge and skill set provided by this program will aptly meet the career objectives of applicants seeking employment as field or laboratory technicians in the environmental and natural resources sector, such as environmental conservation, recreation, wildlife, forestry, and soil and water conservation. This program will also be of value to those wishing to pursue a baccalaureate degree or other additional education and training.

- ESF also works with the local community to increase the diversity of our workforce including participation by ESF Outreach in Syracuse City School District job fairs and the Green Train Landscape and Urban Ecology (GLUE) training program, and participation by ESF Faculty in the ESF Center for Native People and the Environment. Participants represented 8 nations and spoke 13 languages (Table 6). Some were Syracuse natives, while others entered the US as refugees as recently as 2 months prior to the start of the training program. Participants ranged in age from 21 to 61 years old.

Table 6. Countries Represented in ESF's GLUE Program

Country of origin	Number of participants
Bhutan	5
Burma	3
Cuba	2
Congo D.R.	1
Haiti	1
Iraq	2
Sudan	2
United States (1 from Puerto Rico)	10

Languages spoken:
Arabic (Iraq), Creole (Haiti), Dinka (Sudan), Dzongkha (Bhutan), English (United States and others), French (Haiti, Congo D.R.), Hindi (Bhutan), Karenni (Burma), Mabaan (Sudan), Nepali (Bhutan), Sanskrit (Bhutan), Spanish (Cuba, USA-Puerto Rico), and Swahili (Congo D.R.)

Research

ESF is committed to be on the forefront of exploring new areas of research and contributing to the advancement of cutting-edge science that shapes society.

- The Office of Research Programs (ORP) is charged with stimulating and highlighting all ESF research programs. Examples of ESF's efforts to enhance and embark on new research areas include the multi-campus pursuit of NIH funds and the hiring of new, research focused, high profile faculty. The ORP now actively investigates funding opportunities and priorities, and communicates them to the campus community via a monthly e-newsletter, *The Research Times*.
- Faculty members in every department are working on large, collaborative initiatives with partners at other academic institutions in the United States and beyond.
- ESF is embarking on large, multi-campus, multi-investigator programs to identify and train students (graduate and undergraduate) that are interested in engaging the most challenging problems in built and natural environments. A good example is the $3.2 million IGERT proposal, which stretches across departments and universities in the US and Mexico.
- ESF works to implement a homeland security initiative by maintaining projects and national-level expertise in air sensor development, and is working collaboratively with private firms to build and market highly efficient and sensitive instrumentation, particularly on the Great Lakes.

- ESF Outreach offers a variety of research-focused conferences, including:
  - CNY Biotechnology Symposium
  - Green Infrastructure Symposium
  - Leading Sustainability in Public, Private, and Nonprofit Organizations
  - NYS Geographic Information Systems (GIS) Conference
  - NYS Green Building Conference
  - Northeastern Recreation Research Symposium (NERR)
  - Short Rotation Woody Crops Working Group Conference
- ESF's Environmental Resource Engineering academic department exemplifies a commitment to continually investigate new areas of research. This process is facilitated through faculty mentoring and departmental scholarship goals.
- Environmental Studies recently hired a new faculty member whose research focus is on climate change communication.
- Sustainable Construction Management and Engineering faculty are pursuing research in sustainable materials and energy systems in buildings. The Department was recently awarded a grant from NYSERDA to establish a UV/electron beam coating and composite material research and development center.

Goal 7: Invest in ESF's Human Resources and Physical Infrastructure

Human Resources

Since 2003, the College has sought to improve "the ease of doing business." The focus on improving processes is an integral part of ESF's annual Full Cabinet Retreat, Executive Cabinet meetings, Full Cabinet meetings, and Academic Council meetings. The College has reduced administrative paperwork, placed all forms and applications on-line, implemented E-Billing and E-Payment, use of procurement cards to reduce payment transactions, digitalized undergraduate and graduate student applications to facilitate reviews, and authorized discretion where appropriate.

The College's Human Resources Department initiated an employee training initiative approximately five years ago. Similar to students, all new employees receive an orientation that provides an opportunity to impart ESF's mission, vision and values; policies and procedures; sustainability commitment and information specific to employee responsibilities. Training programs offered to all employees are summarized below:

- Sexual Harassment Training
- Work Place and Domestic Violence Training
- United University Professionals Performance Programs/Evaluations Training
- Supervisor Training (five sessions)
- Dealing with the Distressed Student

The College also developed and implemented a series of comprehensive crisis management plans covering the Syracuse campus, Ranger School campus, and the Huntington Wildlife Forest. The plans were developed in 2008 and are revisited by staff on a regular basis.

The College has done well in implementing family-supportive practices for employees. ESF has a Quality of Work Life committee that organizes eight social events during the year, including a pancake breakfast at Heiberg Forest. In support of ESF employees and their families, the College provides an Employee Assistance Program, which offers a full range of support services and referral opportunities. The College also offers

employees a day to bring their sons and daughters to work, allowing them to learn about the role of science and engineering in improving the environment. In recent summers, ESF has offered a 4½ day work week option to faculty and staff, along with the associated flexible work hours.

Table 7. ESF Staff Satisfaction Survey Outcome
(Modern Think Higher Education Insight Survey 2010 Great Colleges to Work For)

	Positive	Carnegie Classification Research
Job Satisfaction	73%	74%
Professional Development	75%	73%
Compensation, Benefits and Work Life Balance	77%	71%
Pride	82%	76%
Senior Leadership	69%	60%
Respect and Appreciation	65%	64%
Survey Average	69%	66%

The performance review process for professional staff captures employee feedback and the annual report process gathers faculty feedback. The College has established a goal to have 90% of professional staff comply with current performance programs by the fall of 2011. This will represent a significant increase over the current 68% compliance rate. Identifying and addressing areas for efficiency and staff development add to the organizational agility of the College. In recent years, the campus community has found ways to grow with constrained resources and has been more opportunistic than at any other time in its 100 year history. Efforts to improve organizational agility will continue to rely on ESF's ingenuity and adaptability, as well as the diversity of the campus community. The College added 5 faculty from under-represented groups from 2003 to 2011. This strategic goal is an area that requires more attention and energy. A breakdown of ESF faculty by gender and ethnicity between 2003 and 2011 is presented below:

Table 8. Faculty Demographic Comparison

	2003	2010	2011
Under-represented	13	17	18
White	107	111	116
Total	**120**	**128**	**135**
% Under-represented	11%	13%	13%
% White	89%	87%	87%

The College is generally recruiting faculty in STEM disciplines for which there is a small but expanding pool of candidates from under-represented groups. This is an area where the College recognizes the need for ongoing improvement.


State University of New York College of Environmental Science and Forestry

STARS

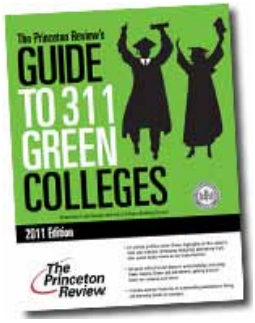
AASHE

STARS

The College annually participates in survey and monitoring processes for salaries of the faculty in conjunction with nation-wide Ph.D. granting institutions. An example of this is the American Chemical Society salary survey. The College has made improvements in this area, but still lags behind the national averages for the ranks of Assistant Professor, Associate Professor and Professor. The President annually allocates resources to make salary adjustments to help bridge this gap. The College has also been fortunate in 2008, 2009 and 2010 to have, by labor contract, annual increases of 4% at a time when many public and private universities have had salary freezes. Continuous improvement in this area is required for the College to meet the objective of having ESF faculty and staff compensated in the top 10% of public-supported collegesand universities.

The College is working to create a climate for the development of National Academy of Science, National Academy of Engineering and Nobel Prize Laureates. In the history of the College, one faculty member won the Kyoto Prize for his pioneering work in the area of living and block polymers. Most recently, in 2009, Professor George Curry was honored by Carnegie/CASE as the top teacher in Higher Education in New York State and was one of 50 awardees selected in the U.S.

Physical Infrastructure



ESF has achieved a green campus distinction, with the Princeton Review listing ESF among 311 of the greenest colleges and universities in the nation. The College has also achieved a silver level distinction from AASHE's STARS program for its campus sustainability efforts. ESF will seek to achieve a STARS gold sustainability distinction within the next three-year self-assessment cycle.

Two physical facility planning efforts have been underway since the completion of the Strategic Plan in 2003. The first was a Combined Site and Program Study undertaken by King & King Architects in 2008, which was funded by the State University Construction Fund (Project #20817). The process engaged many members of the campus community and defined the space requirements based on the projections by department for undergraduate, graduate, faculty, and research staff growth. The study led to the design and construction of the 50,000 GSF Gateway Building and the design of a 103,000 GSF Academic Research Building.

In 2010, the State University Construction Fund, in conjunction with ESF, engaged Mitchell Guirgola Architects, LLP to prepare a campus physical facilities master plan. The preliminary results indicate a need for a student center, an additional student residence and appropriate Landscape Architecture studio space. Plans are also being developed for the renovation of Illick, Marshall and Walters Halls. The physical facilities master plan is expected to be finalized in the first quarter of 2012.

Preliminary findings suggest that the 420,087 NSF of campus infrastructure likely needs to be expanded to 504,527 NSF based on a projection of 2500 students and 160 faculty. Planning is underway to locate a student center, a second student residence and dining center, and upgraded and consolidated maintenance facilities (Figure 6). Campus engagement in these planning efforts will occur through a steering committee, meetings with department chairs and faculty, and a presentation to the ESF Board of Trustees and the campus community this fall.

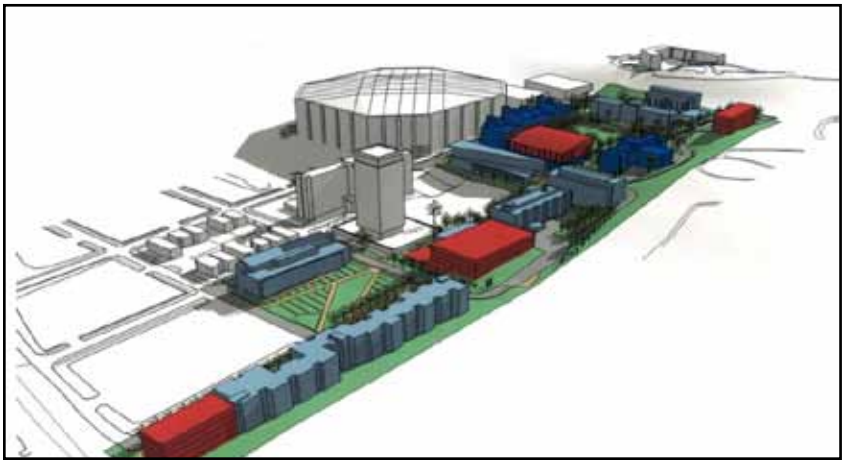


Figure 6. Preliminary Representation of the ESF Campus in 2020

The College continues to improve in the area of regulatory compliance, particularly in the areas of environmental, health and safety. The College has a "Laboratory Safety Guide and Chemical Hygiene Plan" and participated in the USEPA audit program in 2004. During the 2004 inspection, the auditors stated, "Overall, ESF is in phenomenal shape" and "After reviewing many thousands of chemistry labs throughout the northeast, ESF's chemistry labs were the most compliant." Following this baseline audit, a self-audit was completed in 2006 and a review of compliance relative to environmental regulations was initiated in the second quarter of 2011.

The ESF Syracuse campus is largely a wireless campus with over 80% of the public space, including all of the College's new and rehabilitated spaces, serviced by the campus wireless networks. In addition, a good portion of the 15,000 acre Adirondack Ecological Center research forest is served by wireless from the Fire Tower on Goodnow Mountain. The College has made substantial progress in this area.

Through the Sustainability Plan, the Climate Action Plan and the initiatives of faculty and students, approximately 2.5% of the campus energy requirements are met through on-site generated renewable sources. By the fourth quarter of 2012, on-site renewable energy generation should jump to 45% with the completion of the Gateway Building, and the implementation of its innovative combined heat and power system. The College expects the generation of renewable energy on-site will grow to 72.5% of ESF's campus energy requirements by 2015.

Centennial Hall

ESF is working to design an automated indoor environmental control system in the new academic research building that will likely involve an Air Acuity system. The renovation of Baker Laboratory and the design and construction of the Gateway Building have moved the College closer to meeting this objective.

Table 9. SUNY-ESF College-wide Metrics Continually Referred to Throughout the Year

AY 10/11
SUNY-ESF College-wide Metrics

	Strategic Priority	Actual 08/09	Proposed 09/10	Actual 09/10	Proposed 10/11
Development Office					
Fund Raising	4	$2.4M	$2.5M	$1.3M	$3.0M
Annual Fund	4	$330K	$375K	$382K	$400K
Alumni Participation	4	31%	33%	30%	33%
Foundation Assets	4	$21M (as of 3/31/09)	$26.5M	$26.1M	$30.0M
Undergraduate Recruitment/Admissions					
Undergraduate Applications	Q&G	2521	2700	2561	2700
New Undergraduates (fall entry)	Q&G	508 (+17 internal)	505 (SUNY 5 yr. plan)	480 (+19 internal)	505 (SUNY 5 yr. Plan)
% Frosh/Transfer Ratio	Q&G	57/43	58/42 (293 FR/212 TR)	54/46 (261 FR/219 TR)	60/40 (295 FR/210 TR)
Selectivity (Groups 1 & 2)	Q&G	92% (w/special)	92%	89% (w/special)	90%
SAT Scores	Q&G	1185	1190	1183	1190
HS Class Rank Top Quartile Top Half	Q&G	 77% 96%	 78% 96%	 83% 97%	 75% 97%
% Students Admitted (FR + TR)	Q&G	42% (1054/2521)	40%	44% (1129/2561)	42%
% Out of State (FR + TR)	Q&G	16% (83/525)	18%	15% (74/499)	18%
Diversity/Under-represented groups (FR+TR)		9% (49/525)	10% (w/6% AAHANA)	11% (53/499) 6% (AAHANA (32)	11% (w/6% AAHANA)

Through the ESF College Foundation (Abby Lane LLC), the College has acquired thirty individual properties to the west of the campus. The subject properties have provided the footprint to support the location and construction of ESF's first student residence Centennial Hall and a new academic research building that will house the Environmental Forest Biology faculty

Assessment

A strategic planning assessment tool has been developed, which allows ESF to establish and track annual College-wide metrics by each of the priorities presented within the plan. Additionally, ESF produces an Annual Strategic Planning Assessment document reflecting the process the College uses to evaluate its progress in achieving the goals set in the strategic plan. The Assessment document is also used to translate the goals into measurable objectives and planning metrics to guide institutional progress and activities for the upcoming year. This is accomplished through the College's Administrative Cabinet retreat, held typically in August. The President's Cabinet is comprised of the College Vice Presidents, Directors and Assistant or Associate Provosts. This full-day meeting, preceded by two weeks of preparation, focuses on a detailed review of the prior year's metrics, or action items, and then establishing and agreeing upon new metrics for the coming year. New or updated objectives for the coming year are also included in the performance programs of individuals in the President's cabinet to establish a strong linkage between planning objectives and individual performance reviews.

Individual administrative unit missions and assessment plans can be located at http://www.esf.edu/ie/. These unit plans are updated after the annual President's Cabinet Retreat, and individual performance programs may change based on these updates. The administrative units are working toward a greater appreciation of assessment in their units and writing their annual assessment plans.

Table 10. Goals not Currently in Strategic Plan 2009-20

Big Ideas for AY 2009/10
Goals Not Currently in Strategic Plan

GOAL	IMPLEMENTATION			
Goal 1. **Enrich academic excellence in both undergraduate and graduate education**	AY 07/08	AY 08/09	AY 09/10	AY ___
• Promote excellence in teaching				
- Institute $1000 prize and faculty selection process for ESF College Foundation "Exceptional Achievement in Teaching" award	X			
- Review faculty teaching loads to assure equitability and adequate time for scholarship	X	X	X	X
• Institutional Research provides annual summary of instr. activity		X	X	X
• Refine and assess learning objectives in all programs			X	
- Implement revised learning assessment plans			X	
• Enhance lower division experience				
- Offer all lower-division math courses at ESF (not SU)		X		
- Seek to provide more flexibility in curricula, especially in freshman year (ERFEG/PBE)		X	X	X
- Reduce lecture size in lower division courses	X	X		
- Increase access to SU courses (see next item)				X
• Increase student access to SU courses by 50%				X
• Extend honors program to lower division		X		

Big Ideas FY 09/10 *Page 1 of 18* *Rev. 6/30/10*

The College also maintains a matrix to track New Big Ideas that are substantive to the achievement of strategic planning objectives. These assessment and planning tools are reviewed with ESF's Board of Trustees, at Faculty Meeting presentations made by the President, and at student open information sessions. Examples of these tracking and assessment tools are shown in Table 9 and Table 10. The College has made significant progress in achieving its strategic plan objectives. Vision 2020 has been ESF's roadmap since 2003. The College reviews its progress in meeting strategic goals regularly and ESF's annual operating plans are guided by this strategic vision.

In the first quarter of 2012 the College will update the strategic plan in the context of the "Power of SUNY" strategic plan and the annual "report cards," which will represent the progress of SUNY and its 64 campuses in achieving their subject objectives and vision.

The six "Big Ideas" that serve as the foundation for the "Power of SUNY" include:

- SUNY and the Entrepreneurial Century
- SUNY and the Seamless Education Pipeline
- SUNY and a Healthier New York
- SUNY and an Energy-Smart New York
- SUNY and the Vibrant Community
- SUNY and the World

ESF will play a significant role in achieving the strategic goals and vision of the SUNY system.

Vision 2020 and Sustainability at ESF

The 2007 Periodic Review Report for MSCHE drew upon the *Vision 2020* strategic plan and the SUNY planning process 2003-2006 called Mission Review II to identify ESF's goals and the resources needed to achieve them from 2005-2010. Through these efforts, ESF declared its commitment to being a model of environmental sustainability while offering the best possible experience for students, providing the most supportive environment for ESF faculty and staff, and employing the tenets of Continuous Quality Improvement to achieve its goals.

SECTION 3
SUSTAINABILITY

Chapter 7. Sustainability at ESF

ESF's commitment to an environmentally-focused curriculum has existed since the College's opening in 1911. Meeting environmental challenges frames the context of ESF's educational mission. The college educates and trains undergraduate and graduate students as the next generation of environmental thinkers, decision makers and problem solvers.

As ESF embarks upon its second century, the world in which the college operates is changing rapidly. Today's environmental issues are more complex and require consideration of a variety of perspectives and competing interests. With the emergence of global climate change as a national, local, and global issue it is clear that existing loosely- coupled, disciplinary-based "silo" approaches to environmental science education and research will not suffice in the long run and more multidisciplinary and collaborative approaches are needed. As a result of the Vision 2020 strategic planning process, four themes – Applied Ecology and Conservation Biology; Renewable Materials, Energy and Biotechnology; Sustainable Systems and Communities; and Environmental and Natural Resources Information Systems – were conceived to provide a context to integrate and synthesize the cultural, natural and industrial perspectives embracing all of ESF's academic, research and service programs (Figure 7).

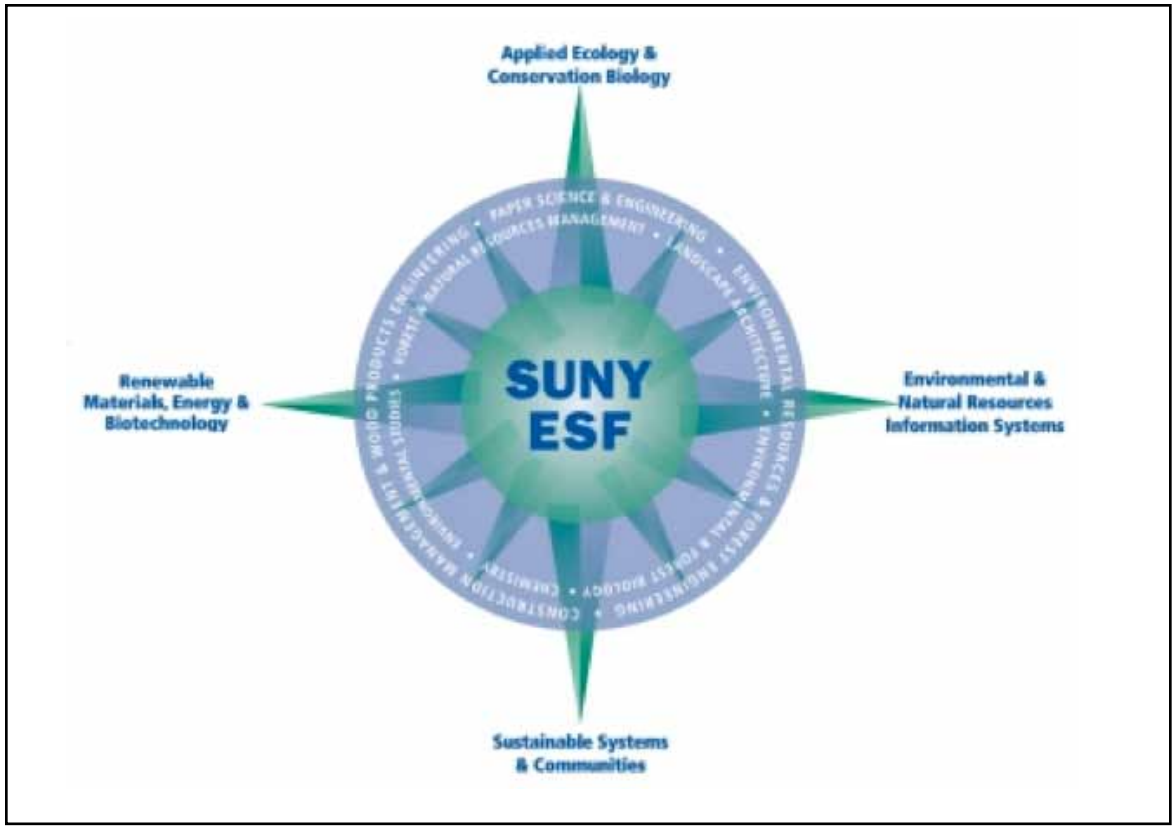


Figure 7. Four Themes Synthesizing ESF Culture, Research and Service

Within this framework, ESF's academic programs operate as fully integrated communities that teach, research, and demonstrate new solutions, new knowledge and new holistic ways of thinking about today's social, economic and ecological problems. "Sustainability" has become the term most associated with this concept as well as the accepted rubric for achieving long term economic, social, and environmental goals. Rising to the challenge of developing a sustainable future is at the very heart of the College's institutional aspiration: *A better world through environmental discovery.*

How does ESF define "Sustainability"?

Of the myriad applications of sustainability perhaps the best known emerged from the 1987 U.N.-sponsored Brundtland Commission report, "Our Common Future." The report defines sustainable development as development "meeting the needs of the present without compromising the ability of future generations to meet their own needs." The Association for the Advancement of Sustainability in Higher Education (AASHE), of which ESF is a member, explains that sustainability encompasses "human and ecological health, social justice, secure livelihoods, and a better world for all generations." According to AASHE, "The interconnectedness and interdependence of the social, environmental, and economic components of sustainability are included throughout 'Our Common Future'."

SUNY ESF's practice of sustainability is similarly grounded in the Brundtland Commission's definition of sustainable development. It begins with the commitment to meet present needs without compromising the ability of future generations to meet their own needs, but recognizes that to do this the College must:

- understand the basic functions of natural and social systems;
- acknowledge and quantify the limitations of nature's capacity; and
- develop solutions through the integration of social, economic, technological, and environmental systems.

Stated more comprehensively, sustainability at ESF recognizes not only the need for intergenerational equity but that natural, economic, and social systems are so interdependent that they must be considered in an integrated way.

Relationship to Stewardship

The Merriam Webster Dictionary defines stewardship as, "the careful and responsible management of something entrusted to one's care." The US Environmental Protection Agency's definition of environmental stewardship is "the responsibility for environmental quality shared by all those whose actions affect the environment . . . For many, sustainability is now the end goal, one that can assure a more secure future and that is naturally pursued through environmental stewardship."

ESF's approach to sustainability reflects the College's long-standing commitment to environmental stewardship. At ESF, sustainability is a natural extension of the College mission. As expressed in SUNY-ESF **Vision 2020:**

> *The mission of the College of Environmental Science and Forestry is to advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments.*

Although ESF must continue to meet the campus community's immediate needs, the College also carries the responsibility to train tomorrow's leaders. ESF must be in the forefront not only in advancing science, technology, and education; but also in demonstrating to the world that sustainable actions are possible and not prohibitively expensive by turning the campus into a classroom and requiring that institutional practices be aligned with the ecological lessons the College teaches.

Viewed within this context, sustainability is seen as more than just transferring knowledge about sustainability issues and how to address them. Sustainability involves changing mindsets, developing skills in critical and systemic thinking, and enhancing capacity for facilitating change. It is about producing graduates who "anticipate the consequences of their actions on the environment, articulate those consequences to society, and promote behaviors and actions that result in sustainable environmental systems from the local to the planetary levels."

ESF Sustainability Goals

Given the context for ESF's practice of sustainability and its relationship to stewardship, the College has outlined specific sustainability goals and methods to achieve these goals below:

1. Enhance the student experience to produce graduates who use their knowledge to foster actions that lead to increasingly sustainable societies.
   This specifically relates to course and curriculum content, service learning opportunities and student activities. Examples include:
   a.) The environmental and energy audit courses used to calculate the campus carbon footprint
   b.) The renewable energy systems undergraduate minor
   c.) The Green Campus Initiative (GCI) student group
   d.) Student internships involving sustainability related activities

2. Grow the College research enterprise to foster sustainable societies. Examples include:
   a.) Cellulosic biomass and renewable energy related research
   b.) Sustainable community/green infrastructure related design and research
   c.) Environmental conservation research to preserve species, diversity and habitats

3. Champion sustainability through on-campus demonstration. Examples include:
   a.) Student, faculty and administration involvement in the campus climate action plan, and Carbon Neutrality Plan
   b.) Green Campus initiative (GCI) which is now engaged in waste minimization, energy conservation, slow food and education/awareness activity
   c.) Physical and operational sustainability improvements that have interpretive information or instant readout

The College intends to meet these goals by:

Teaching ESF students about what is understood about how to live sustainably: This will involve careful re-examination of courses and curriculum for sustainability and systems integration within and across disciplines. This requires a move from uni-disciplinary to multi and transdisciplinary approaches in the delivery of sustainability-related material (Reiter et al, 2011). This may also involve increased utilization of experiential and community based learning to engage students directly in sustainability applications. Measurement could include a cross-referenced course content sustainability guide and cross-disciplinary course content.

Engaging in research that advances understanding: Given the four point model for college-wide research presented earlier, future faculty directed research as well as student engagement in research should move toward multi and transdisciplinary research design and organization. This means that social science, humanities and physical sciences need to work together in a more integrated fashion when applied to sustainability research and development. Measures include developing research projects that address sustainability issues while involving investigators from multiple disciplines.

Serving as an operational model: Meeting this goal will require that campus students, faculty, staff and administration move together with constant dialogue and communication to become a more sustainable community. Using a model based in environmental mediation, this requires constant involvement with no party overshadowing the other stakeholders. It is important to examine communication modes and linkages to ensure that campus community members understand how this activity contributes to sustainability. This also means that sustainability action plans and activities should have identified roles for implementation and evaluation. Measures include communications media tracking sustainability activity on campus, in addition to tracking the coverage of this activity off campus.

The following report sections discuss progress in achieving each of the three sustainability goals, and the respective methods for meeting them, outlined above. Each of the following goal discussions also identifies the challenges ESF must overcome to accomplish these sustainability goals and achieve improved sustainability outcomes.

Chapter 8. Sustainability Goal 1 – Education - Enhance the student experience to produce graduates who use their knowledge to foster actions that lead to increasingly sustainable societies

Building on ESF's first rank among SUNY doctoral institutions and third among all SUNY Institutions in student satisfaction, the College established additional commitments to enhance the student experience regarding sustainability outcomes. By enhancing the student experience, the intent of the College is to further promote intellectual and personal growth, thereby producing graduates who are prepared to live increasingly sustainable lives and to engage in actions that foster improvements toward a more sustainable society. This section of the report presents the results of an assessment of ESF's faculty, educational offerings, and curricula as they relate to the topic of sustainability. ESF's three principles of sustainability were used during this assessment, and are reviewed in Section VII.

In addition, this section addresses parts of Middle States standards 10 (Faculty), 11 (Educational Offerings), and 12 (General Education) in its relationship to sustainability. Sources of information used for this assessment include departmental annual reports, faculty and graduate student surveys, and other student surveys.

Where do we want to go?

The 2007 PRR identified several opportunities to enhance the student experience in regards to sustainability. These opportunities, together with additional opportunities identified since the release of the PRR are outlined below. The opportunities center around three main aspects of the Education component of the sustainability goals. Specifically, they address the courses and curricula that are offered at SUNY-ESF; the extracurricular activities and student life aspects of the campus; and the international opportunities that are available.

1. Develop courses and curricula that focus on sustainability.
   a. Incorporate sustainability concepts in existing courses and programs where appropriate.
   b. Incorporate campus sustainability goals and initiatives into first year student orientation and courses (132 seminars).
   c. Create ways to effectively communicate which courses include sustainability components (sustainability-focused or related, as per AASHE).

2. Engage student groups in activities that promote sustainability in students' lives on campus and in the community.
   a. Incorporate sustainability in the new Residence Hall experience.
   b. Promote outreach to the community through service learning and student organization activities.

3. Develop additional cost-effective study abroad opportunities and help students to prepare experiences related to sustainability.
   a. Develop international experiences integrated into appropriate curricula.
   b. Develop international experiences that apply broadly to ESF students as well as students outside of ESF.

The following sections will assess where ESF is now in relation to achieving these opportunities and identifying the challenges in achieving these goals, and how the challenges will be met.

Where are we now?

1. Develop courses and curricula that focus on sustainability.
   a. Incorporate sustainability concepts in existing courses and programs where appropriate.
   b. Incorporate campus sustainability goals and initiatives into first year student orientation and courses (132 seminars).
   c. Create ways to effectively communicate which courses include sustainability components (sustainability-focused or related, as per AASHE).

SUNY-ESF was established on the principles of sustainability and protection of the environment, regardless of the terms to describe this concept over the past 100 years. Therefore, sustainability is a theme that runs through many courses even when not explicitly indicated in the course title or description: It is part of the basic structure of the College. Thus, in terms of meeting this objective, many courses and programs incorporate sustainability, often as a major theme or focus of the course and program. In addition, the faculty are hired on the basis of their expertise, which provides the foundation to effectively teach sustainability as part of all the educational programs on campus.

Perhaps because sustainability is an inherent component of ESF's institutional identity and the College's dedication to principles of sustainability are integrated into everyday operations, the College strives to be more effective in explicitly communicating how ESF courses and programs address the issues of sustainability. As can be seen in the discussion below, many courses are either focused on or related to sustainability. The college and faculty could improve its visibility in this area by highlighting those courses that have a sustainability focus. This could be done in a manner similar to how some institutions designate courses that have a "Writing Emphasis" (e.g., PSE 210W indicates that the course has a strong writing component). Courses with a "Sustainability Emphasis" could be similarly distinguished. The term "sustainability" is not included in the course descriptions for some sustainability-related courses. As course descriptions come up for review, sustainability-related concepts should be added as appropriate in order to make assessments of sustainability courses simpler in the long term. Once these terms are included in the course descriptions, an interactive and searchable electronic catalog would allow students to quickly find courses with a sustainability emphasis.

Faculty involvement in sustainability

ESF faculty members are involved in a diversity of fields, including sustainability. A recent faculty survey conducted at ESF indicates that approximately 88% of 88 responding faculty members have been involved in teaching, research, or service related to at least one of ESF's three Principles of Sustainability since June, 2009 (Table 11). Eighty-eight percent of responding faculty members have a degree related to sustainability: 65 faculty members have a sustainability-related Bachelor's degree, 64 a sustainability-related Master's degree, and 53 a sustainability-related Ph. D. Two faculty members have additional certifications related to sustainability, and 37 have taken continuing education courses related to sustainability to increase their knowledge and skills.

Approximately 45% of the faculty members involved in sustainability research, teaching, and service have had work experiences outside higher education related to sustainability. The experiences of 44 of the faculty members surveyed were related to ESF's first and second Principles of Sustainability, while the work experiences of 61 faculty were related to Principle 3 (overlap exists between categories since the work experiences of some faculty members were related to more than one principle).

Table 11. Faculty Involvement in Sustainability at ESF

Number of faculty by department and survey response. Percentages of faculty involved in sustainability research, teaching, and/or service are included.

Department	Total Number[a]	Number of survey respondents[b]	Percent survey respondents involved in sustainability[b]
Forest and Natural Resources Management	38	16	88%
Environmental and Forest Biology	51	24	83%
Chemistry	19	8	75%
Paper and Bioprocess Engineering	25	4	100%
Sustainable Construction Management and Engineering	8	6	83%
Landscape Architecture	19	6	100%
Environmental Studies	18	9	100%
Environmental Resources Engineering	14	6	83%
Department not identified on survey	---	9	89%
Totals	**192**	**88**	**88%**

[a] Includes Assistant/Associate/Full Professors; Visiting Instructors; Research Scientists; Instructional/Project Support Specialists; Research Associates. Information compiled from 2010 ESF Telephone Directory.

Results from faculty survey.

Teaching Assistant involvement in sustainability

During the 2009-2010 academic year 142.5 state-funded Graduate Assistant positions were provided to ESF students who assist with course delivery and grading (TAs). Of the 101 TAs who responded to a graduate student survey, 8% had an associate's degree, 50% had a bachelor's, 16% a masters, and 3% a doctorate; 35% did not indicate a degree. For those who had a degree prior to coming to ESF, all who responded to the campus questionnaire had received at least one degree in a field related to one or more of ESF's principles of sustainability.

According to ESF's faculty survey, 51 of 77 respondents (66%) reported that they had taught a class related to sustainability between June, 2009 and December, 2010. Of these faculty members, 17 (33%) had taught at least one sustainability-focused course; and 42 (82%) had taught at least one sustainability-related course (see definitions below). In addition, faculty reported that 88 undergraduates and 73 graduate students completed a sustainability- related internship or independent study project between June, 2009 and December, 2010.

All courses at ESF, including those that are sustainability-related, go through a stringent review process (both at the departmental and college-wide level) prior to their acceptance. Faculty course proposals are reviewed by their department's Undergraduate Education Committee (for undergraduate courses) or Graduate Education Committee (for graduate courses). After approval by the appropriate committee, the faculty in the department must approve the new course or course changes. Following departmental approval, the course proposal is submitted to ESF's Committee on Instruction and opened for campus-wide review and final acceptance. All course proposals must be written to specific standards, which are placed for faculty use on the COI's website. Clear course objectives, concepts covered, and a well-written course description are required. Review of course descriptions reveals that some sustainability-related courses do not include the term "sustainability" in their course descriptions, even though faculty survey results reveal that the concept of sustainability is taught in the course. Courses are evaluated by students through an online process. Students are able to rate different aspects of each course (e.g., course content, instructor's teaching ability) as well as enter comments. Both ratings and comments are used by instructors to improve courses.

Continued growth in sustainability involvement

Continued growth is shown by faculty as they seek to expand their knowledge and skills regarding sustainability. According to ESF's faculty survey, approximately half of the faculty involved in sustainability-related teaching, research, and service attended continuing education classes or workshops related to sustainability between June, 2009 and December, 2010. The average faculty member (i.e., of those who did attend a continuing education class or workshop) attended 2.7 sustainability-related classes or workshops during this time period.

SUNY ESF's policies regarding promotion and tenure also require a demonstration of "continued growth" for all faculty during reviews and promotion consideration. ESF's policies are based on the policies of the SUNY Board of Trustees that lists five criteria for consideration during the evaluation of academic employees, including continued growth.

For teaching assistants, continued growth is encouraged from the beginning of their educational program. Every year, the Outreach Office offers the College-wide "Graduate Assistant Colloquium on Teaching and Learning" for incoming graduate students. This two-day program describes the culture and expectations of ESF; outlines instructional survival skills and specific teaching-related skills necessary to function effectively as a GA; highlights some of the people and units who provide leadership and support to GA efforts; and introduces professional skills and resources that will endure beyond the ESF graduate assistant experience. This program is not intended to teach sustainability, per se, but a discussion of sustainable practices (e.g. the reduction of paper usage by converting to web-based distribution of materials) is included. In the future the College could include a 'special topics' session – as it has done with other selected topics - that is devoted to sustainability and sustainable practices on-campus. Further information about the "Graduate Assistant Colloquium on Teaching and Learning" is available at http://www.esf.edu/iq/colloquium.

Support for faculty and staff at ESF is shown through support for work assignments that vary by faculty member, staff support, and availability of appropriate teaching and research facilities. Faculty work assignments are defined by Department Chairs in consultation with faculty members, and are usually broken down by percentage of time spent in teaching, research, and service. ESF's promotion and tenure policies acknowledge differences in work assignments for faculty members of similar academic rank. A faculty member's work assignment is taken into consideration during promotion and tenure reviews. The newest guidelines suggest that a memorandum (written and signed by the Department Chair in consultation with the candidate) summarizing the work assignment is included in each candidate's promotion and tenure file.

A faculty survey asked if they had adequate staff support to assist with their teaching, research and service. Thirty-five percent of faculty indicated that support was either always adequate or very often adequate; 29% said sometimes adequate, 17% reported that it was rarely adequate, and 19% that it was not adequate. When faculty were asked if the learning resources available to them were adequate for their teaching goals, 88% indicated always or very often adequate; 12% indicated that they were sometimes adequate and 2% that they were rarely adequate. With regard to instructional technology services (ITS), the majority (82%) of faculty found ESF's computer network services to be either very good or good; a similar percentage (85%) was

identified for the campus computer servers. Desktop computers were found to be either very good or good by 67% of respondents.

The majority of faculty members also encourage their students to use many of the facilities and services on campus. For example, 72% require their students to use Moon Library's online resources and 53% require use of Moon Library's print resources; 49% also require students to use Syracuse University libraries. For computer resources, 41% of the faculty surveyed require their students to use ESF's computer clusters and 10% ESF's GIS labs. Diverse online resource use is required by 71% of faculty.

When asked if a permanent office dedicated to sustainability is needed on campus, 23% strongly agreed; 23% agreed; 29% were neutral, 14% disagreed, and 11% strongly disagreed. Faculty were also asked if a permanent staff member dedicated to sustainability is needed: 26% strongly agreed, 19% agreed, 27% were neutral, 17% disagreed, and 11% strongly disagreed.

Sustainability-Related Curriculum

This assessment of educational offerings evaluated the degree to which each of the different degree programs at ESF addresses the College's mission and vision regarding sustainability. This is based on a review of published course requirements from the undergraduate programs at SUNY-ESF and the course descriptions available in the catalog. ESF's sustainability principles were used as the standard for the review in this section (see Section VII for more information about these principles).

A review of curricular descriptions and response to an undergraduate/graduate education coordinator survey both indicate that every undergraduate and graduate degree program at ESF contains at least one (and, in most cases, many) required courses that address sustainability principle 1; principles 2 and 3 are fulfilled in many of the programs as well. For programs that do not fulfill principles 2 or 3, it is possible for students to use elective courses or a minor to fulfill these principles.

Courses related to sustainability at ESF

In order to identify the courses that are related to sustainability, ESF has developed the following guidelines based on the definitions presented in AASHE's STARs Manual:

Sustainability-focused course: This type of course has sustainability as the course goal, and identifies one or more measurable learning outcomes that are explicitly focused on the topic of sustainability.

Sustainability-related course: This type of course has a primary goal other than sustainability, but incorporates at least one module or activity that produces a measurable learning outcome that is explicitly focused on the topic of sustainability.

A full list of ESF's sustainability-focused and related courses is included in Tables 14 and 15. Further assessment of the curricula shows that all undergraduate programs offer at least one sustainability-focused or sustainability-related course as part of degree requirements (see Table 12). In most cases, multiple sustainability-related courses are included in the list of required courses. Electives and minors offer students the opportunity to take additional sustainability courses. All graduate programs offer students the chance to choose sustainability-related and focused courses.

*Table 12. Undergraduate Programs by Number of Sustainability Focused and Related Courses**
Only required courses are included in this table. All departments offer sustainability courses as electives.

Department/Division	Program/Option	Number of sustainability-focused, required classes	Number of sustainability-related, required classes
Sustainable Construction Management and Engineering	Construction Management	5	7
	Wood Products Engineering	5	7
Environmental Resources Engineering	Env. Resource Engineering	1	4
	Forest Engineering	1	4
Forest and Natural Resources Management	Forest Resources Management	0	6
	Natural Resources Management	1	6
	Forest Ecosystem Science	0	8
Environmental and Forest Biology	Wildlife Science	0	5
	Aquatic and Fisheries Science	0	7
	Forest Health	0	6
	Biotechnology	0	7
	Conservation Biology	2	6
	Environmental Biology	0	6
	Nat. History and Interpretation	0	8
Environmental Science	Env. Information and Mapping	0	5
	Renewable Energy	1	6
	Environmental Analysis	0	7
	Watershed Science	1	6
	Health and the Environment	0	5
	Earth and Atmospheric Systems Sci.	1	5
Environmental Studies	Env. Communication, Culture and Writing	1	3
	Env. Policy, Planning & Law	2	3
	Biological Science Application	1	3
Paper and Bioprocess Engineering	Bioprocess Engineering	0	4
	Paper Engineering	0	4
	Paper Science	0	3
Chemistry	Chemistry	0	5
Landscape Architecture	Landscape Architecture	1	5

Sustainability-related courses for program minors

Twelve ESF minors (Table 13) are offered to all students at both ESF and SU; ten minors offer sustainability-focused/related courses as either required courses or directed electives. An additional four minors (not directly related to sustainability) are offered at SU and are open to ESF students.

Table 13. Undergraduate Minors by Number of Required and Directed Elective Sustainability Focused and Related Courses

2010-11 Academic Year

Minor	Number of sustainability-focused, required classes	Number of sustainability-focused directed electives	Number of sustainability-related, required classes	Number of sustainability-related directed electives	Number of courses required for Minor
Bioprocess Science	0	*	2	*	6
Paper Science	0	0	0	0	6
Chemistry	0	0	1	4	5
Environmental Writing and Rhetoric	0	0	0	2	4
Forestry	0	na	2	na	5
Recreation Resources and Protected Area Management	1	na	1	na	5
Water Resources	0	1	0	6	5
Sustainable Construction Management	0	*	3	*	5
Construction Management	0	0	3	0	6
Renewable Energy	1	1	1	2	5
Urban Environmental Science	0	**	0	**	4
Urban Forestry	1	na	1	na	5

*Directed electives for this minor are not listed in the College catalog

**Independent study and internship credits related to sustainability may be included in this minor depending on each student's interests

Honors Program sustainability-related courses

A Lower Division Honors Program and Upper Division Thesis Honors Program are offered at ESF to undergraduate students with GPAs at or above 3.4. The lower division program includes both one sustainability-focused and one sustainability-related course. The upper division program offers students the opportunity to engage in an undergraduate thesis project related to sustainability or another field (based on the student's interests).Table 14. Sustainability-Focused Courses at ESF

Table 14. Sustainability-Focused Courses at ESF
(U= Undergraduate level, G= Graduate). Data compiled from faculty survey.

Course title	G	U	Credit hours
CME 132 Orientation seminar: Sustainable Construction			
Management and Engineering		√	1
CME 215 Sustainable Construction		√	3
CME 305 Sustainable Energy Systems for Buildings		√	3
CME 387 Renewable Materials for Sustainable Construction		√	3
CME 422 Composite materials for Sustainable Construction		√	3
EFB 220 Urban Ecology		√	3
EFB 413 Introduction to Conservation Biology		√	3
EFB 419 Problem Solving in Conservation Biology		√	3
ERE 519 Green Entrepreneurship	√		3
ERE 475 Ecological Engineering II		√	3
ERE 496 (CME 215) Sustainable Construction		√	3
ERE 596 Ecological Engineering for Waste Management	√		3
ESC 335/535 Renewable energy	√	√	3
ESF 109 Honors Seminar in Env. Science and Forestry		√	1
EST 132 Introduction to Environmental Studies		√	3
EST 390 Social Processes and the Environment		√	3
EST 426 Community Planning & Sustainability		√	3
EST 427/627 Environmental & Energy Audit	√	√	3
EST 550 Environmental Impact Analysis	√		3
EST 650 Environmental Perception and Human Behavior	√		3
EST 626 Concepts and Principles of Sustainable Development	√		3
FOR 296 Concepts of Watershed Hydrology		√	
FOR 340 Watershed Hydrology		√	3
FOR478/FOR678 Wilderness and Wildlands Management	√	√	3
FOR 665 Natural Resources Policy	√		3
FOR 670 Resource and Environmental Economics	√		3
FOR 770 Ecological Economics and Policy	√		3
FOR 796 Adirondack Park Science and Policy	√		
LSA 311/611 Natural Processes in Design & Planning	√	√	3

Table 15. Sustainability-Related Courses at ESF

Course title	G	U	Credit hours
BPE520 Bioseparations	√		3
BPE 420 Bioseparations		√	3
CLL 190 Writing and the Environment		√	3
CLL 290 Writing, Humanities, and the Environment		√	3
CLL 291 Writing, Humanities, and the Environment (Honors)		√	3
CLL 410 Writing for Environmental Professionals		√	3
CLL 494 Creative Non-fiction in the Sciences		√	3
CME 304 Environmental Performance Measures for Construction		√	3
CME 306 Engineering Materials for Sustainable Construction		√	3
CME 343 Construction Estimating		√	3
CME 376 Decay of Wood Products		√	3
CME 453 Construction Planning and Scheduling		√	3
CME 454 Construction Project Management		√	3
EFB 101 Organismal Biology and Ecology		√	3
EFB/EST 120 Global Environment		√	3
EFB 307 Principles of Genetics		√	3
EFB 308 Genetics Lab		√	1
EFB 320 General Ecology		√	4
EFB 400/600 Toxic Health Hazards	√	√	3
EFB 423/623 Marine Ecology	√	√	4
EFB 424/624 Limnology	√	√	3
EFB 445/645 Plant Ecology and Global Change	√	√	3
EFB 484/684 Winter Mammalian Ecology	√	√	3
EFB 485 Herpetology		√	3
EFB 487/687 Fisheries Science and Management	√	√	3
EFB 496/796 Plant Propagation	√	√	3
EFB 496/796 Watershed Ecology	√	√	3
EFB 518 Systems Ecology	√	√	4
EFB 522 Biophysical Economics	√		3

Course title	G	U	Credit hours
EFB 525 Limnology Practicum	√		2
EFB 535 Flowering Plants: Diversity, Evolution, and Systematics	√		3
EFB 611 Topics in Environmental Toxicology	√		3
ENS 519 Spatial Ecology	√		3
ERE 468 Solid Waste Management		√	3
ERE 489 Environmental Resources Engineering Planning and Design		√	3
ERE 671 Colloid and Interface Science	√		3
ERE 796 Ecological Engineering and Design for Sustainability	√		3
ESC 422/622 Energy markets and regulation	√	√	3
ESF 209 Honors Seminar in Env. Science and Forestry		√	1
EST 132 Introduction to Environmental Studies		√	3
EST 296 Introduction to Human Geography		√	3
EST 361 History of the American Environmental Movement		√	3
EST 366 Attitudes, Values, and the Environment		√	3
EST 606 Environmental Risk Perceptions	√		3
EST 608 Env. Advocacy Campaigns and Conflict Resolution	√		3
EST 625 Wetland Policy and Management	√		3
EST 635 Public Participation and Decision Making	√		3
FCH 222 Organic Chemistry Lab I		√	1
FCH 496 Marine Biogeochemistry		√	3
FCH 511 Atmospheric Chemistry	√		3
FCH 515 Methods of Environmental Chemical Analysis	√		3
FCH 551 Polymer Techniques	√		3
FCH 552 Polymer Science: Properties and Technology	√	√	3
FCH 571 General Wood Chemistry	√		2
FCH 796 Aquatic Organic Chemistry	√		3

Course title	G	U	Credit hours
FOR 132 Orientation: Forest and Natural Resources Management		√	1
FOR 296 Concepts of Watershed Hydrology		√	1
FOR 312 Sociology of Natural Resources		√	3
FOR 322 Forest Mensuration		√	3
FOR 345/545 Introduction to Soils	√	√	3
FOR 360/560 Principles of Management	√	√	3
FOR 373/573 Forest Operations	√	√	3
FOR 402 Professional Forestry Mentoring Program		√	1
FOR 476/676 Ecotourism and Nature Tourism	√	√	3
FOR 490/690 Integrated Resource Management	√	√	3
FOR 496 Human Dimensions of Nat. Res. Mgt.		√	3
FOR 481 Intro to Arboriculture		√	3
FOR 480/680 Urban Forestry	√	√	3
FOR 523 Tropical Ecology	√		3
FOR 535 Advanced Forest Soils	√		3
LSA 132 Orientation Seminar: Landscape Architecture		√	1
LSA 220 Introduction to Landscape Architecture		√	3
LSA 425/458/459/460 Off-Campus Studio sequence		√	3
LSA 470 Urban Design Studio		√	6
LSA 470 Cultural Landscape Treatment Studio		√	6
LSA 481/681 Cultural Landscape Preservation		√	3
LSA 696 Plant Ecology and ID	√		2
LSA 697 Topics/Issues of Landscape Architecture	√		1
WPE 497 Senior seminar		√	3

Student assessment of ESF experience

ESF currently offers 22 undergraduate programs and 30 graduate degree programs with 66 study areas at the MPS, MF (Master of Forestry), MS, and PhD levels. All programs are designed to foster coherent learning experiences and to promote synthesis of learning. Preliminary results of ESF's 2010 Annual Graduating Student Survey (though not specific to sustainability) reveal important findings concerning student experiences at ESF. Out of the 293 undergraduate and graduate student respondents to the survey, 30% were active in research projects with faculty, highlighting synthesis of learning.

Out of the 154 student respondents that were employed full or part time, 82% were employed in a field related to their major. Of the 180 students who responded to the question "what was the most valuable academic or extracurricular experience you had while at ESF?" the following responses were received:

In total, 186 student comments highlighted academic experience as most valuable during their time at ESF, with 24 comments highlighting specific extracurricular activities (some students provided more than one comment);

- 5 students cited "the entire ESF experience"
- 44 students mentioned particular professors
- 21 students highlighted specific courses unique to the ESF curriculum
- 15 students mentioned the "hands-on experience" in classes
- 28 students mentioned internships or teaching assistant experience
- 20 students highlighted working on research with their professors
- 42 students highlighted special programs ESF offers including study abroad (16 students), research programs offered by EFB (UMEB) and LA departments (3), programs at the Ranger School (9), Wanakena (5) and Cranberry Lake (8), as well as the Thousand Island Biological Stations(1)
- Fellowships (3), lab experience (5) and senior class projects (5) were also mentioned

Curricular experiences

In December, 2010, the College conducted a survey of undergraduate and graduate education coordinators. Nine of the ten respondents to the survey indicated that a student evaluation is administered to assess student experiences for their undergraduate/graduate program. These evaluations are used by departments to improve programs at both the undergraduate and graduate levels. In addition, course evaluations are conducted online at the end of each semester and results are used by faculty members to improve course content and delivery.

Pre-orientation programs for students

The faculty in charge of pre-orientation programs were contacted to determine the extent that pre-orientation programs address ESF's principles of sustainability. Most of these programs have been, or are expected to be, canceled as a result of budget restrictions. The coordinators of these programs indicated that sustainability, as defined above, is not the focus of their programming. They generally focus on skills necessary for new students and team-building, rather than curricular content.

Library resources and programs

The library conducts a number of guest lectures and on-campus programs to teach and encourage the use of learning resources. Most of those resources in the current information environment are electronic. Among the most useful for students and faculty are RefWorks and LibGuides. RefWorks is an online tool for bibliographic management that allows researchers to order their citations in a variety of citation styles, as appropriate for their classroom and publication requirements. LibGuides is an electronic tool that allows students to create pathfinders, or traditional library research guides in an electronic environment. These can be used to point to a variety of information formats, both physical and electronic, to assist students remotely, and to provide detailed research suggestions around the clock.

Library resources are used to provide information to support sustainability in the classroom, research, and on campus. In addition, there is an inherent sustainability in the efficient use of electronic resources. This allows us to dispense with the use of paper handouts, and other ephemeral but resource-intensive tools. Further, the content of LibGuides and RefWorks can and does support teaching and research efforts that have a sustainability focus as delineated in the ESF Principles of Sustainability.

Departmental 132 courses and General Education

Ten orientation seminar classes (1 credit hour; EST 132 is 3 credit hours) are offered in the fall semester for incoming freshman and transfer students in each department at ESF. These courses are designed to orient

students to campus life, introduce them to department faculty, expand their knowledge of their program of study, and expand their knowledge of campus information and learning resources. Nearly all of these courses introduce students to library databases and other online resources. Diverse presentations by faculty members offer students the opportunity to learn about different fields and to interact with faculty. Half of the 132 courses introduce students to topics related to sustainability, and introduce students to the green technologies found on the ESF campus.

ESF's curricula are designed so that students acquire and demonstrate college-level proficiency in general education and essential skills, including oral and written communication, scientific and quantitative reasoning, critical analysis and reasoning, and technological competency.

In 1998, the State University of New York Board of Trustees (SUNY Board) established a 30- credit SUNY General Education Requirement (SUNY-GER) that required recipients of baccalaureate degrees to have demonstrated knowledge and skills in ten areas (American History, Arts, Basic Communication, Foreign Language, Humanities, Math, Natural Sciences, Other World Civilizations, Social Sciences, and Western Civilization) and competency in two areas (Information Management and Critical Thinking). Faculty agreed on a set of university- wide student learning outcomes for each area that guides the development of SUNY-GER courses and enables those courses to transfer seamlessly within the University. In 2010, the SUNY Board approved a revised SUNY-GER that offers students greater flexibility (30 credits in seven of ten areas plus the two competency areas) while continuing to promote academic excellence, student mobility and degree attainment. SUNY-ESF is exempt from the Foreign Language GER due to its specialized mission and lack of foreign language course offerings. Consequently, graduates of bachelor degree (B.S.) programs are required to complete 27 credit hours of coursework distributed among the remaining nine knowledge and skill areas.

An array of courses (that have been Faculty and SUNY-approved) is available to all undergraduate students to satisfy the general education requirements. The approved courses are published in the College Catalog (http://www.esf.edu/catalog/2010-2011/pdf/2010-2011Catalog.pdf), on the Registrar's web page (http://www.esf.edu/registrar/genedcourses.htm), and on the SUNY Provost web page (http://www.suny.edu/provost/generaleducation/CourseList/mastercampuslist.cfm). In considering how the SUNY-GER is operationalized at SUNY-ESF, the College assessed how and whether the study of values, ethics and diverse perspectives in SUNY-GER is important to each of the three SUNY-ESF sustainability principles.

The SUNY-ESF general education program requires students to demonstrate knowledge and skills in two areas related to ESF's first sustainability principle, understanding basic functions of natural and social systems. Specifically, students satisfying the area of Natural Sciences will demonstrate understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis; and the application of scientific data, concepts, and models in one of the natural sciences. Students satisfying the Social Sciences area will demonstrate understanding of the methods social scientists use to explore social phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical and interpretive analysis; and knowledge of major concepts, models and issues of at least one discipline in the social sciences.

All ESF programs of study require a natural science course (ranging from biology to chemistry to physics), while most require at least one social sciences course, such as FOR 207 Economics. EFB 120 (Global Environment and the Evolution of Human Society) is one of three ESF courses that satisfy the Social Sciences General Education area, and the only one of the three that is sustainability-related. In academic year 2009-10, 223 undergraduate students were enrolled in EFB 120, indicating that this course serves nearly 20% of matriculated undergraduate students in any given year. Given the student distribution (74 freshmen, 91 sophomores, 38 juniors and 20 seniors) of the class, it can be inferred that nearly 80% of ESF students are exposed to sustainability-related principles in social sciences by the end of their tenure at ESF.

There is no specific articulation of sustainability and the stated objectives of the ESF General Education program. It is evident that the purpose of General Education at ESF is first to meet SUNY General Education requirements and second to meet program-specific requirements. The role of sustainability in General Education at ESF could be more explicitly stated. There is implicit evidence, as summarized in Table 16, that ESF

undergraduate students are exposed to sustainability principles by meeting General Education requirements in Basic Communication, as well as three other areas: Natural Sciences, Humanities and Social Sciences. Four approved General Education courses that are related to natural resources and the environment (often involving a historical development of sustainability principles) are shown in Table 17.

Table 16. Sustainability-Related Approved General Education Courses at ESF as Reported from Faculty Survey

Course title	GenEd Area	Credit Hours
CLL 190 Writing and the Environment	**Comm**	**3**
CLL 290 Writing, Humanities, and the Environment	**H**	**3**
EFB 101 Organismal Biology and Ecology	**NS**	**3**
EFB 120 Global Environment and Evolution of Human Society	**SS**	**3**
EFB 320 General Ecology	**NS**	**4**

Table 17. Natural Resource and Environment Courses Approved as General Education Courses at ESF

Course title	**GenEd** Area	Credit Hours
EST 200 Cultural Ecology	OWC	3
FOR 204 Natural Resources in American History	AH	3
LSA 190 Clashing Perspectives in Built Environment	WC	3
FOR 203 Western Civ and the Environment	WC	3
EFB 217 Peoples, Plagues and Pests	OWC	3

All ESF degree programs require CLL 190 to satisfy basic communication needs, thereby exposing students to an understanding of social and environmental systems as well as written communication. All degree programs require CLL 290 Writing, Humanities, and the Environment to satisfy the Humanities requirement; CLL 290 has elements of sustainability related to values and attitudes about social and natural systems. Programs at ESF also require a public presentation class (not related to sustainability) designed to enhance oral presentation skills. Science, math, and other technological competency courses are required in all programs at ESF. EFB 320 (General Ecology) and EFB 101 (Organismal Biology and Ecology) are both sustainability-related courses (see Table 15).

Communicating Sustainability Course and Program Opportunities

ESF students have had difficulty identifying sustainability course offerings, and while some come to the realization that sustainability is embedded in nearly all ESF operations and programs, without explicitly labeling these offerings with the term sustainability the College faces the challenge of effectively communicating available choices. This is a challenge that requires ongoing consideration to be overcome.

An ESF graduate student proposed a process to have faculty identify courses with keywords that will be searchable in the catalog to identify sustainability-focused and related courses. This effort was approved and will be conducted during the 2011-12 academic year to be implemented by Fall 2012.

Creating New Sustainability-Related Programs and Courses

In addition to curricular opportunities through departmentally sponsored programs, ESF has an interdepartmental program structure. The Division of Environmental Science at SUNY ESF houses a unique, interdepartmental effort that brings together faculty from all departments to provide curricular opportunities that extend beyond those provided by any single academic department. The general structure of the Division beyond the Director and Graduate and Undergraduate Coordinators includes a Curriculum Group Leader for each undergraduate option or major, and an Area of Study (AOS) Leader for each graduate area of study. Each option and AOS has a group of faculty associated by appointment to provide curricular oversight, and at the graduate level to review applicants and serve as the petition review body for that AOS. Participating faculty associated with the Graduate Program in Environmental Science are responsible for reviewing applications to and serving as major professor for students in that AOS. This structure provides ESF with a means to offer curricula with strong relevance to sustainability by addressing emerging issues that cross departmental boundaries.

A successful Environmental Science Program is an institutional priority as a way to help share and implement the College's namesake program and bring more interdisciplinary efforts to ESF's high quality students. Participating departments and faculty in this program have an opportunity to participate in a curriculum directly related to their scholarly interests in interdisciplinary efforts. Not only is there an opportunity to work with high quality students and to promote cross-department efforts, but also potentially have access to additional resources.

Since the reorganization of the Division of Environmental Science, we have launched one new program effort, in the form of a new option area of Renewable Energy, and a graduate program in Sustainable Energy Management was recently approved. A few others in progress for both undergraduate and graduate options include Environmental Health, Biophysical and Ecological Economics, and Restoration Ecology. The challenges we face to create new programs include finding the faculty resources to develop and support them. While we have an extraordinary level of interest in such programs at ESF (more than a third of the faculty participate in the Environmental Science Division), it is always difficult to launch new programs when we are in fiscal contraction. It is especially challenging to launch new programs when resources are so limited that even reallocation is not feasible. An additional challenge that arises under these conditions is that we have less flexibility due to faculty constraints. Faculty are often called upon to increase their contributions to the functioning of their home departments, which limits the time they have for interdepartmental efforts.

2. Engage student groups in activities that promote sustainability in students' lives on campus and in the community.
    a. Incorporate sustainability in the new Residence Hall experience.
    b. Promote outreach to the community through service learning and student organization activities.

News, Publications, and Online Resources

Linkages among scholarship, teaching, student learning, research and service concerning sustainability are made through several informational sources on campus. The online "E-Center" provides links to many different sustainability-related programs and efforts on campus. The following webpage links are included:

- Environmental Information Series (http://www.esf.edu/ecenter/eis/). This web page provides links to many articles on natural resources and sustainability.
- Nature in Your Backyard (http://www.esf.edu/ecenter/backyard/). Videos introducing both children and adults to many wildlife and plant species in New York are presented. The basic information provided in these videos provides the foundation for learning about sustainability.
- Going Green (http://www.esf.edu/ecenter/goinggreen/). Short videos provide insight into how green technologies can be implemented.
- ESF YouTube videos. Approximately 245 ESF videos related to environmental topics (including sustainability) are available through YouTube. An example of one of these is http://www.youtube.com/SUNYESFVIDEO.

- Water Drops (http://www.watershedhydrology.com/html/WaterDrops.html). This series of short, 2-minute radio clips is produced by Professor Emeritus Dr. Peter Black and is regularly broadcast in Central New York.

In addition to the E-Center website, two other sustainability-related websites are available through ESF's website:

- Green Campus Initiative (http://www.esf.edu/org/gci/). The Green Campus Initiative is an ESF student organization dedicated to making the ESF campus greener and more sustainable.
- Sustaining the Green (http://www.esf.edu/Sustainability/). This website provides information about sustainability-related initiatives at ESF. This website provides a link for students, researchers, and the public to obtain information about green initiatives on campus. Sustainability-related events and programs are promoted on this website, fostering connections both on-campus and off.

Linkages are also provided between administration and faculty through several newsletters:

- Academic Affairs newsletter. Produced through ESF's Provost's office, this newsletter provides updates for faculty and staff about research and outreach, policy changes, and personnel changes at ESF. Campus-wide programs related to sustainability are often included in the newsletter.
- Inside ESF. Produced biannually, ESF's magazine frequently includes articles about activities at ESF that are related to sustainability and green technologies. This magazine is distributed among faculty, staff, and alumni.
- Outreach e-newsletter. This newsletter is produced by ESF's Outreach office and frequently contains information about upcoming sustainability-related workshops, certification programs, and other programs.

In addition, ESF has a student-produced newsletter, *The Knothole,* which frequently includes information and articles about green initiatives and sustainability-related programs on campus. This newsletter is read by students, faculty, and staff. The College also has placed a kiosk on campus where faculty, staff and students can access information about ESF's latest sustainability initiatives.

Sustainability and ESF's Outreach Efforts

ESF's Office of Outreach leads and supports programs on- and off-campus for a range of audiences including youth, teachers and professionals, all with an aim to enhance education, leadership, and practice in the science, design, engineering, and management of natural resources and the environment (http://www.esf.edu/outreach/). Programs offered by ESF Outreach that illustrate our commitment to sustainability include:

Leading Sustainability in Public, Private and Nonprofit Organizations Workshop. This program is designed for individuals who are responsible for thinking strategically and technically about their institution's sustainability agendas. Participants learn to understand what aspects of their current institutional plans and operating procedures are critical to future success. Experienced practitioners provide real-world examples of the benefits and costs associated with the adoption and use of renewable technologies and sustainable practices, as well as authoritative perspectives, recommendations, and resources that inform sustainability-related decision-making, practice and policy.

SAGE: Sustainable and Green Entrepreneurship. The SAGE Project engages high school students and teachers with people and ideas that demonstrate the green entrepreneurial spirit. Participants become better versed in entrepreneurial thinking, the science of environmental challenges, and the role they can play in meeting these challenges. The SAGE Project builds upon the region's natural, economic, educational and workforce resources to support the sustainability and green entrepreneurship education and professional development needs of students, teachers, and professionals. The College's goal is to create a "green entrepreneurial culture" of informed and prepared young people in the region.

SURE: Sustainable Use of Renewable Energy. The Sustainable Use of Renewable Energy (SURE) program is offered by SUNY ESF as a collaborative effort of the Sustainable Enterprise Partnership, a partnership of

SUNY-ESF, the Whitman School of Management at Syracuse University, and the Syracuse Center of Excellence in Environmental and Energy Systems. This program offers an overview of the conceptual framework of renewable energy ideas, issues and decisions in addition to an active exchange about critical and timely energy topics.

SPARE: Solar Power As Renewable Energy. In this course students learn the basics of how to site, design, and install photovoltaic (PV) systems. The course includes sizing systems for both grid-connected and off-grid PV systems. In addition, the course reviews solar resources and the problems associated with shading, orientation and tilt. Students learn about various mounting systems for PV arrays and how they affect roofs. As part of the class, students build a working PV system.

ESF in the High School. This partnership program between SUNY ESF and High Schools throughout New York State enables qualified students to: experience college-level course work while still in high school; understand the complex scientific and social perspectives behind the environmental issues that make headlines every day; ; and learn about and explore diverse interests and career opportunities in environmental science, engineering, management, policy and design, as well as in related areas such as law, communications, technology and medicine.

ESF Science Corps. For affiliated schools, the ESF Science Corps volunteers are science resources for teachers and students who are engaging in original inquiry. Science Corps members are "front line," in-school role models and resources for students whose college and career plans are taking shape. Funded initially by a National Science Foundation grant, the ESF Science Corps is comprised of ESF undergraduate, Master and Ph.D. students, faculty and other volunteers. ESF Science Corps members integrate their research and professional experiences into classroom, lab and field experiences through in-school, on-campus and workplace presentations, discussions and demonstrations. ESF faculty and educational specialists serve as Science Corps facilitators and mentors.

Co-curricular Experiences

Students at SUNY ESF are exposed to numerous institution-sponsored sustainability experiences, starting with admissions tours of campus, new student orientation, and continuing through graduation in the form of student clubs, internships, and activities. The Undergraduate Admissions Office provides an "ESF Campus Tour Manual" for student ambassadors who give prospective students tours of campus. During this tour, the ambassadors highlight several of the sustainability projects and features on campus,all of which are also highlighted on campus through improved signage/increased use in classes. These include:

- LEED Silver-Certified Baker Laboratory, the Illick bio-retention garden, the Green Roof and Hydrogen
- Fuel Cell in Walters Hall, and the Biodiesel Fuel Refinery located in the old greenhouses on campus. The manual also highlights that 20% of the College's energy comes from renewable resources.

New student orientation for undergraduate students has involved a "Saturday of Service" event since 2003 that promotes sustainability in nearby city, county, and state parks, as well as the relationship between SUNY-ESF and the Syracuse community. Through clean-up and maintenance service projects, approximately 330 students are involved in this program each year. Based on the Graduating Student Survey (conducted annually by the SUNY-ESF Career Services Office; 293 respondents for a 75% response rate for the class of 2009-2010), 29% percent of student respondents indicated that they were involved in community service during their time at SUNY-ESF. At both graduate and undergraduate orientation sessions, sustainability is directly promoted by providing students with a reusable mug to be used throughout their time at ESF, allowing for trash free events and decreased waste on campus. Students also receive a 1 GB memory stick that contains all the new student information that had previously been handed out in paper form. Graduate students in particular are provided with a guide to living sustainably in Syracuse, developed by the Office of Instruction and Graduate Studies and the Graduate Student Association (GSA). Both orientations are currently being reassessed by the Office of Instruction and Graduate Studies and the Student Activities Office to better integrate sustainability practices in orientation activities, including highlighting the sustainable features of the SUNY-ESF campus, as well as working toward a green orientation program with the student-led Green Campus Initiative (GCI).

Matriculated students can gain sustainability learning experience through community service opportunities, internships, and annual events such as Earth Week. Promoting sustainability both on and off campus, all freshmen are required to participate in at least one service project in their first semester that is directly related to sustaining the environment. These have included projects such as education programs at Beaver Lake Nature Center, planting trees in urban areas, and removing invasive species in Selkirk Shores State Park to protect and improve the native environment. The Student Activities Office also hosts a campus day of service open to all students, faculty, and staff that promotes sustainability on campus and in the Syracuse community; this program has attracted over 50 students each semester for the past nine years.

Aside from community service, students can obtain non-credit internships outside their formal curricula. While it is difficult to determine how many of these internships are directly related to ESF's principles of sustainability, results from the Graduating Student Survey indicate that 22% of student respondents of the class of 2009-2010 took part in these internships, making them an integral part of the co-curricular experience.

Students are also actively involved in SUNY-ESF sponsored campus events such as Earth Week, which promotes celebrating, protecting, and learning about the environment. A highly attended series of events each year, the 2010 Earth Week included the dedication of the new student-designed Waverly Rain Garden, Clothing Swap and Repurposing workshop, a panel on the Syracuse Bureau of Planning and Sustainability, a campus waste audit, and a lecture by Dr. Robert Costanza on "Overcoming Systemic Roadblocks to Sustainability: The Evolutionary Redesign of Worldviews, Institutions, and Technologies." These events are planned by the Student Activities Office in conjunction with student representatives of the GCI. GCI, while an extracurricular student club, is involved in numerous co-curricular events outside of Earth Week, including the 2008 audit of campus greenhouse gas emissions and the campaign for energy conservation on campus.

New co-curricular experiences are often being developed at SUNY-ESF. Centennial Hall, a student housing project that was completed in the summer of 2011, is an environmentally friendly building that will house 280 incoming freshmen in learning communities dedicated to community and sustainability.

Extracurricular Activities

Students also have the opportunity to become involved in extracurricular activities related to sustainability through student activity groups. Over 40% of student respondents in the class of 2009-2010 were active in student clubs on campus (Graduating Student Survey). Student activity groups directly related to sustainability include: The American Fisheries Society, American Water Resources Association, Bob Marshall Club, Green Campus Initiative, Green Construction Group, Nautilus Society, Society of American Foresters, Trout Bums, ESF Women's Caucus, and the Conservation Biology Club.

The Undergraduate Student Association (USA), Graduate Student Association (GSA), and ESF Women's Caucus (a group comprised of faculty, staff, and students) also organize events on campus each year dedicated to promoting community and education, as well as sustainable practices including trash-free events, speaker series, and opportunities for students to interact and participate in events both on and off campus. The Women in Scientific and Environmental Professions Seminar Series (sponsored by the ESF Women's Caucus), for example, frequently has speakers come to ESF who are involved in sustainability-related research in the U.S. and abroad.

Collaboration through ESF's Centers and Councils

ESF, via its many Centers, Councils, and Institutes, promotes collaborative efforts among faculty members that foster sustainability literacy and technological competency skills across the curricula. Of the 17 Centers, Councils, or Institutes surveyed, nine actively promote collaborative efforts across the curriculum toward one or more of ESF's sustainability goals. These include the Adirondack Ecological Center, the American Chestnut Research and Restoration Center, the Center for Community Design Research, the Empire State Paper Research Institute, the Herman L. and Gertrude Joachim Endowment Fund, the ESF Center for Native Peoples and the Environment, the Randolph G. Pack Environmental Institute, the Salix Consortium, the Center for the Urban Environment, and the SUNY Center for Brownfield Studies. More about each of these centers and institutes can be found in Appendix 3.

3. Develop additional cost-effective study abroad opportunities and help students to prepare experiences related to sustainability.
    a. Develop international experiences integrated into appropriate curricula.
    b. Develop international experiences that apply broadly to ESF students as well as students outside of ESF.

SUNY-ESF currently offers a number of international opportunities for students at both the undergraduate and graduate levels (http://www.esf.edu/international/studyabroad/default.htm). Given ESF's focus on sustainability, study abroad programs allow students to apply their knowledge gained on campus in an international context. While abroad, students also have the opportunity to broaden their knowledge of ecological, economic and social elements of sustainability. Students are eligible to study abroad after completing at least 30 credits toward a bachelor's degree and having achieved a GPA of 3.0 or higher. The study abroad programs are coordinated through the Office of International Education, which is part of the Dean of Instruction and Graduate Studies Office. All applications must be processed through this office. Our approach to international experiences is through the Academic Departments. Each department is to develop international opportunities for students such that they are integrated into the programs they support, thereby becoming a choice each student makes at a certain point in the program. This approach builds in the marketing of the opportunities by showing it as a programmatic choice at a particular point in the curriculum and by clarifying up front the credits earned and how it fits within the program.

Currently ESF offers several international experience opportunities, most short-term in nature. The landscape architecture program offers the most substantial and integrated international experience at ESF and serves as a model for this effort. The challenges to establishing and maintaining such international opportunities include the financial limits faced by our students. To be feasible, the international experience must be cost effective. Another challenge is the establishment and maintenance of the strong relationships with institutions and colleagues that provide the foundation for these experiences in other countries. At least one member of the faculty must have a strong enough interest and good connections with faculty elsewhere to make this work. Additionally, this kind of relationship requires resources of time and money to sustain once the partners are identified, especially difficulty under the current financial constraints.

Study Abroad Short-term Opportunities

SUNY-ESF offers several faculty-led, short-term international academic courses throughout the academic year. Since the courses are offered by ESF, students enroll in the course directly with the college and credits and grades earned appear on students' transcripts. These courses typically occur during school breaks or over the summer. Therefore, students can avail themselves of these opportunities without interrupting the normal flow of their program. Over the past year, the following short-term courses were available to students at SUNY-ESF, although a number of them were cancelled due to low enrollment:

Spring 2011

- FOR 523/EFB 523 Tropical Ecology

Summer 2011

- FOR 496/696: Social–Ecological Conflicts and Sustainability: Case Studies in Costa Rica and Nicaragua
- FOR 496 Sustaining Human Societies & the Natural Environment New Zealand
- BPE 498: Sustainable Environmental Management in Sichuan, China
- BPE 230: China Experience
- EST 696: Superpowers in Global Environmental Politics--China & the US (Taught at Wageningen University, Netherlands)

Fall 2011

- ERE 496/596: Ecosystem Restoration Design (Mexico)

Study abroad opportunities in Landscape Architecture

The Landscape Architecture Off-Campus Program is the "capstone" experience for students enrolled in ESF's Undergraduate Landscape Architecture (LA) degree program, and one of the most unique educational opportunities within the State University of New York. Every student pursuing a Bachelor of Landscape Architecture is required to participate in the program. Since 1970, over 1500 LA students have studied in over 45 different countries and around the United States.

The LA Off-Campus Program is centered on the idea of an "experiential studio." It is quite different, however, from most studio or laboratory-based programs, which also teach through example and participation. Students in the Off-Campus Program identify a particular design related study topic, and then develop plans to leave the traditional university setting and travel to locations that are uniquely suited to the topic. Students have the opportunity to see and experience exemplary works of landscape architecture in the best locations in the world. At the same time, students learn from experiencing unfamiliar places, cultures and languages, and gain insight into the natural and cultural environment, which exceeds limited exposure in the classroom.

Studies may take several forms – they may be relatively independent, focusing on a particular student's interests and aspirations (Self-Described Study); they may be directed by a faculty member's interests or research (Faculty-Described Study); or they may be more applied and directed by a local group or organization on-site, similar to an internship arrangement (Work-Study). Each group is coordinated and advised by a participating faculty member, and assisted by an on-site consultant who is most often a local ESF alumnus, landscape architect, or university professor.

International Exchange Programs

As part of SUNY-ESF's commitment to providing international experiences for its students, the College established international exchange programs at foreign institutions with environmentally-focused course offerings. These programs allow students to fully engage in education at the foreign university and to experience the host country's culture for periods of one semester to one year. Currently, there are two active programs being offered through SUNY-ESF as listed below:

Munich University of Applied Sciences (MUAS)

- The Munich University of Applied Sciences is the largest university of its kind in Bavaria and one of the largest in Germany. Its great variety of well-structured programs, instruction in small groups, and its excellent connections with industry and commerce make it a highly renowned university.

  Munich is one of the leading economic regions in Europe and renowned for its educational landscape. The city is home to over 20,000 high-tech firms, a range of major banks and insurance companies, market leaders in the media sector and specialist branches of industry. In this environment the University of Applied Sciences – München developed a high-quality, differentiated, and application-oriented program. Additional information about the services provided to exchange students at MUAS, is available online: http://www.uas7.org/ .

Sichuan University

- Sichuan University is located in downtown Chengdu, a famous historic and cultural city known as "the land of abundance". It consists of three campuses of Wangjiang, Huaxi and Jiangan, and covers an area of 7050 mu (470 hectares). Sichuan University has a comprehensive range of disciplines covering 11 categories, namely, liberal arts, science, engineering, medicine, economy, management, law, history, philosophy, agriculture and education.

  It consists of 30 colleges, including a postgraduate college and an overseas education college. Sichuan University has been strong in science and research and making remarkable achievements over the years. It has 9 key national laboratories and engineering centers, 1 key laboratory for national defense, 9 key laboratories and 4 engineering research centers under the supervision of the Ministry of Education, and 3 key laboratories under the supervision of the Ministry of Health.

Study Abroad through other institutions

Students can also take advantage of study abroad opportunities at other institutions.

Studying Abroad with the SUNY System

- A searchable database of SUNY study abroad programs is available on the main SUNY website. Students can search for programs by term, location, and campus.

Studying Abroad with SU Abroad

- SU Abroad offers two types of study abroad programs-- SU Overseas Center programs and SU World Partners programs.
- There are currently seven overseas centers, in Beijing, Florence, Hong Kong, London, Madrid, Santiago (Chile) and Strasbourg (France). These centers function as SU campuses abroad.
- SU World Partner programs are affiliate universities with whom SU maintains cooperative agreements.

Studying Abroad with an ESF Affiliate Program

- SUNY-ESF has established affiliations with institutions that provide study abroad programs of particular interest to ESF students. Current affiliations include: the School for Field Studies and Living Routes: Study Abroad in Ecovillages.

Studying Abroad with a Non-SUNY, Non-Affiliated Program

- SUNY-ESF students are encouraged to select the study abroad program that best meets their personal, educational, and professional development goals. Accordingly, ESF students may participate in any study abroad program they desire as long as they obtain approval via the ESF Study Abroad Request Process prior to applying to the study abroad program. Non-affiliated environmentally-focused study abroad programs include: Wildland Studies; SIT; ProWorld Service Corps; CIEE, EcoQuest; Organization for Tropical Studies; SEA Semester; SEAmester; Ceiba Foundation for Tropical Conservation; Institute for Sustainable International Studies Belize.

Students are also encouraged to search the following databases for program opportunities: IIEPassport database; GoAbroad.com; StudyAbroad.com; and Abroad101.com where you can search by program location, field of study, and type of program (e.g., semester, summer).

Student research and non-academic programs abroad

SUNY ESF students are encouraged to pursue opportunities that will best meet their personal, educational, and professional development goals. Students who are conducting research abroad related to their ESF academic program or participating in non-academic programs abroad (e.g., Engineers without Borders) are REQUIRED to comply with the college policies for all international programs including submitting the complete packet of Student Research Abroad Forms with supplemental documentation to the Office of International Education prior to departure.

Key Findings and Recommendations

An assessment of faculty, educational offerings and General Education requirements reveals that sustainability, overall, is well integrated into teaching, research, and service at ESF. However, changes in how the College reports data are needed in order to simplify the collection of sustainability-related, campus-wide information for future assessments.

- SUNY-ESF was instituted on the principles of sustainability and protection of the environment, regardless of the terms to describe this concept over the past 100 years.
- The concept of sustainability is well integrated into ESF's vision for the future; its integration into the College's mission statement should be considered.
- ESF's principles of sustainability provide an important first step in assisting faculty members with

defining the types of sustainability-related teaching, research, and service they do. Identifying sub-principles that clearly identify how each principle relates to each department would further clarify the meaning of the principles for faculty at ESF.

- The college and faculty could improve visibility in this area by highlighting those courses that have a sustainability focus.
- The term "sustainability" is not included in the course descriptions for some sustainability-related courses. As course descriptions come up for review, sustainability- related concepts should be added as appropriate in order to make assessments of sustainability courses simpler in the long term.
- Courses with a "Sustainability Emphasis" could be similarly designated.
- Programs such as the GA Colloquium on Teaching and Learning are not intended to teach sustainability, per se, but a discussion of sustainable practices (e.g. the reduction of paper usage by converting to web-based distribution of materials) is included. In the future the College could include a 'special topics' session – as has been done with other selected topics - that is devoted to sustainability and sustainable practices on-campus.
- All undergraduate programs currently offer at least one sustainability-focused or sustainability-related course as part of their required courses.
- All graduate programs currently offer students the chance to choose sustainability-related and focused courses.
- There is implicit evidence that ESF undergraduate students are exposed to sustainability principles by meeting General Education requirements in Basic Communication, as well as three other areas: Natural Sciences, Humanities and Social Sciences.
- Students at SUNY-ESF are exposed to numerous institution-sponsored sustainability experiences, starting with admissions tours of campus, new student orientation, and continuing through graduation in the form of student clubs, internships, and activities.
- The new Centennial Residence Hall provides opportunities for increased integration of sustainability between the academic and extracurricular aspects of college life. The incorporation of sustainability into the activities and culture of the new residence hall will greatly enhance the educational opportunities of the students.
- Programs outside of Landscape Architecture and Paper and Bioprocess Engineering should consider how study abroad experiences could be integrated into their academic programs.
- Short term international experiences available to all students on campus are needed to create the critical mass for offering these courses. Because of the small size of some programs at SUNY-ESF, these international programs may have difficulty in reaching this critical mass within departments. Short-term courses that meet the requirements of multiple programs on campus (especially General Education requirements) would broaden the appeal to students.

Closely tied to the goal of enhancing the student experience at ESF, the next section discusses sustainability Goal 2- Research: Grow the College research enterprise to foster sustainable societies. Assessment of the College's progress in achieving this goal reaches beyond the campus community and, as discussed, requires partnership to overcome the challenges in achieving improved sustainability outcomes for ESF's research enterprise.

Chapter 9. Sustainability Goal 2 – Research: Grow the College research enterprise to foster sustainable societies

Introduction to Research at ESF

ESF's research portfolio is diverse and multidisciplinary, including the biological, ecological and physical sciences, several engineering disciplines, landscape and community design, and studies focused directly on the societal implications of environmental policy and the evolution of sustainable societies. The research enterprise plays a vital role in advancing the College's vision of "a better world through environmental discovery," and its mission to "advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments." Global recognition of the need to investigate and understand sustainability continues to stimulate research programs and opportunities at ESF.

This chapter relates in part to MSCHE Standard 10, Faculty.

Where do we want to go?

In ESF's 2007 Periodic Review Report (PRR), the following opportunities were identified to grow sustainability-related research at the College:

a. Increase the number of faculty; more faculty members can conduct more research

b. Reallocate faculty positions to fields of high research need

c. Increase financial resources to fund: (1) start-up packages for new faculty hires, (2) seed grants for faculty members embarking on new research directions, and (3) funding matches required for many forms of sponsored research

d. Enhance facilities for research

e. Enhance ability of faculty members to successfully compete for research funding through mentoring and services that identify appropriate funding sources and aid in grant proposal preparation and submission

f. Utilize workload and reward policies to promote excellence in research without detracting from excellence in teaching

Where are we now?

Overview of ESF Research Activity

Research has been a significant part of ESF's mission since the institution's inception. Research is understood to contribute in many ways to the College's mission including:

- Research activities enable ESF faculty to create new knowledge and to expand their depth of scholarship within their respective fields of study
- Research is integral to the academic development of ESF undergraduate and graduate students by providing training in the scientific method and state-of-the-art techniques and procedures of data analysis, both on campus and in the field
- Research provides a foundation for intra and inter-institutional collaboration and a focus for interaction, both domestically and internationally, with private corporations, governmental agencies and non-governmental organizations
- In some cases, research contributes to the College's Service / Outreach mission with respect to local and regional communities and constituencies
- As a major objective of SUNY and the SUNY Research Foundation, research activities and subsequent inventions and intellectual property can stimulate regional economic growth

ESF is classified by the Carnegie Institute of Higher Education as a Research University/High Activity campus based on its output of research doctoral degrees and its level of sponsored research activity. During fiscal year 2010-2011, 87% of ESF faculty members were working on 506 currently funded projects with a book value of $61.2 million, reflecting the faculty's commitment to and success in securing external support and the College's solid infrastructure for conducting advanced studies. Over the past three years, ESF's sponsored program expenditures have average approximately $14 million per year, placing the College near the top of the SUNY system on an annual per capita basis. Among SUNY doctoral universities, only Stonybrook and Downstate Medical Center had greater per capita sponsored program expenditures in the last year, if the massive state funding of Albany's Nanotech Center is excluded (Table 18).

Table 18. Sponsored Program Expenditures

SUNY Doctoral Degree Granting Institutions	FYTD Total ($) 830,494,209	Per Capita ($) 157,828.62
University at Albany	337,410,975	514,346.00
Binghamton University	38,645,532	66,630.23
University at Buffalo	151,962,038	97,536.61
Stony Brook University	183,970,738	126,527.33
SUNY Downstate Medical Center	60,585,838	137,382.85
Upstate Medical University	40,931,591	104,952.80
SUNY-ESF	13,356,043	108,585.71
College of Optometry	3,631,454	60,524.23

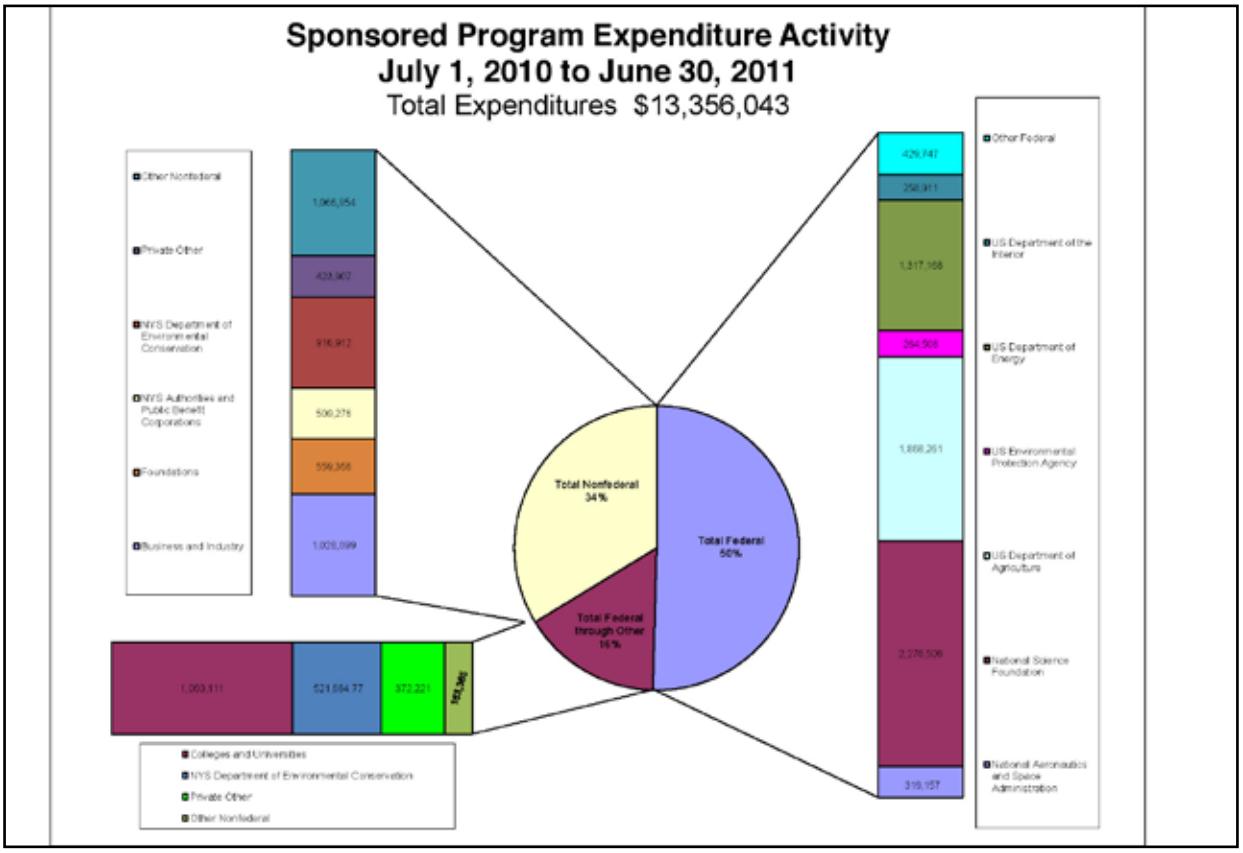


Figure 8. Sponsored Program Expenditure Activity (Broad Categories)

ESF draws support from a diverse array of sponsors. Approximately half of the College's sponsored funds are provided by a mix of federal agencies, with the National Science Foundation awarding the largest share (Figure 8). The other half comes from an even greater variety of state and local government agencies and non-profit and for-profit private enterprises. A significant amount of research is conducted in support of state agencies, such as the Department of Environmental Conservation and the Department of State, who are asking sustainability-related questions.

Most of the sponsored support, almost 90%, is expressly for research. The majority of the remainder supports outreach and teaching programs that are integrated with the College's research mission (Figure 9).

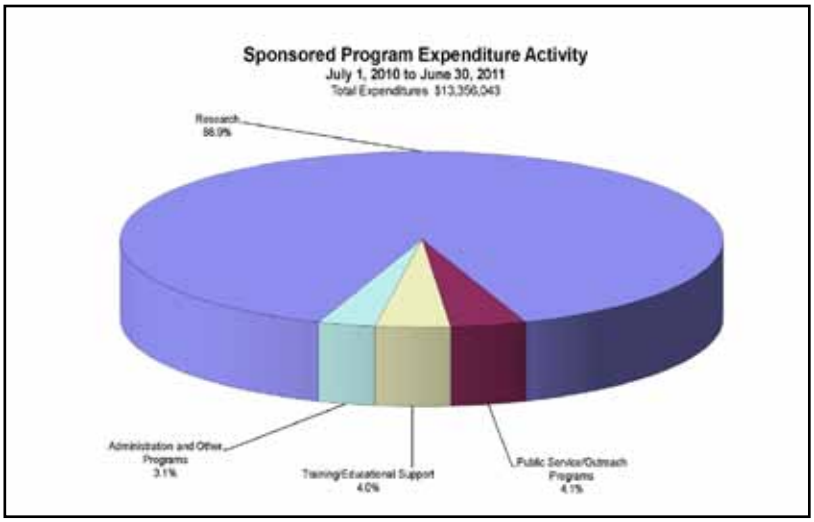


Figure 9. Sponsored Program Expenditure Activity

Research Goals and Assessment

The 2007 MSCHE PRR document identified an institutional aspiration to grow the college research enterprise to foster sustainable societies. Vision 2020 included a target to increase sponsored research expenditures by 8% per year (Figure 10). In addition, we set a goal of increasing the number of refereed journal articles per faculty member from 1.2 to 2.2 per year (Figure 11). These parameters, which measure in rough terms research effectiveness and national competitiveness, are now tracked routinely. Other metrics which indicate the health of the research enterprise are also followed closely. These include the number of research proposals, their dollar volume, yield (success) rate, average size, distribution among agencies, ARRA (stimulus) funding and numbers of graduate students supported by research funds.

Looking just at research expenditures and number of peer-reviewed research papers published, over the past eight years progress in meeting our objectives is evident. From 2004 to 2010, the College saw steadily increasing research expenditures. AY 2010-2011 saw an anomalous decline due to the delayed initiation of some approved awards. However, growth is expected to resume in AY 2011-2012 with sponsored research expenditures conservatively projected to reach a record $16.6M. For the eight-year period (through AY 11-12), annual average growth in research expenditures will exceed 6%. This is short of the goal of 8% per year, but respectable in the current funding environment. During the same period, peer-reviewed papers published by ESF's faculty also increased steadily from 1.2 to 1.5 per faculty member per year. The Academic Council target remains at 2.2 papers per faculty member per year which is projected to place ESF in the top 100 research universities.

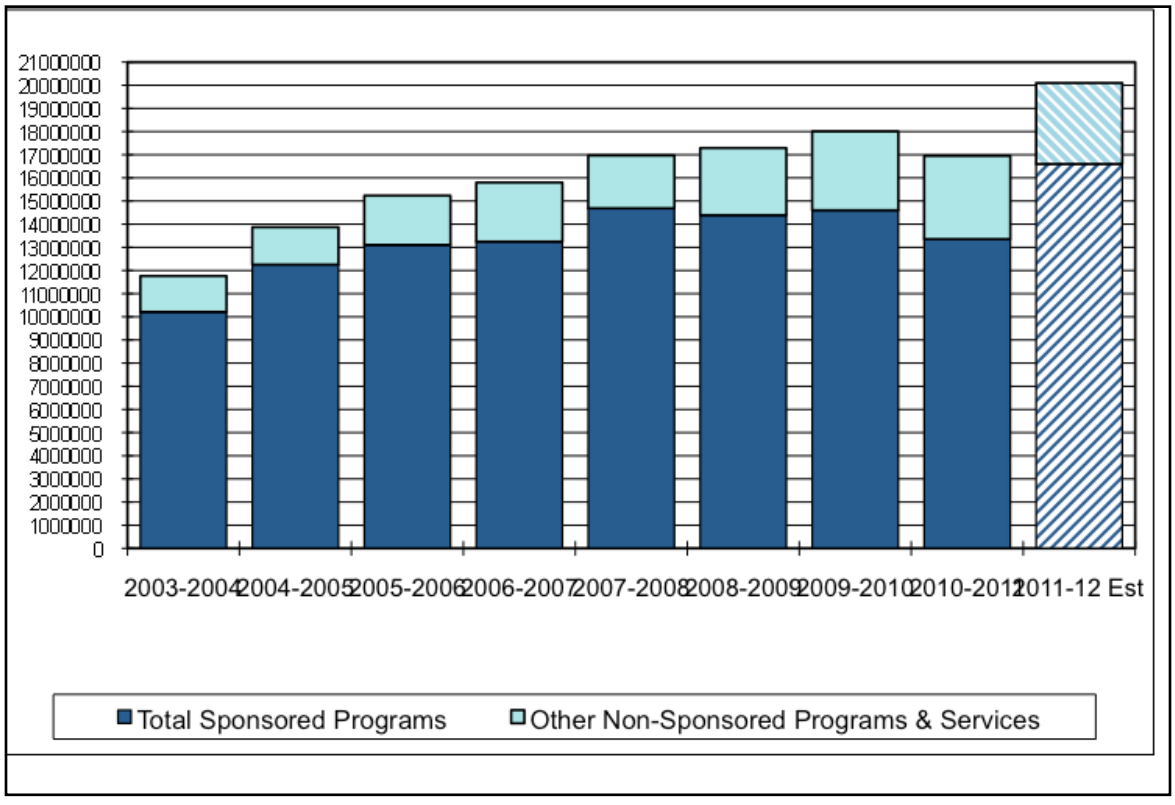


Figure 10. Research Expenditures 2004 -- 2011

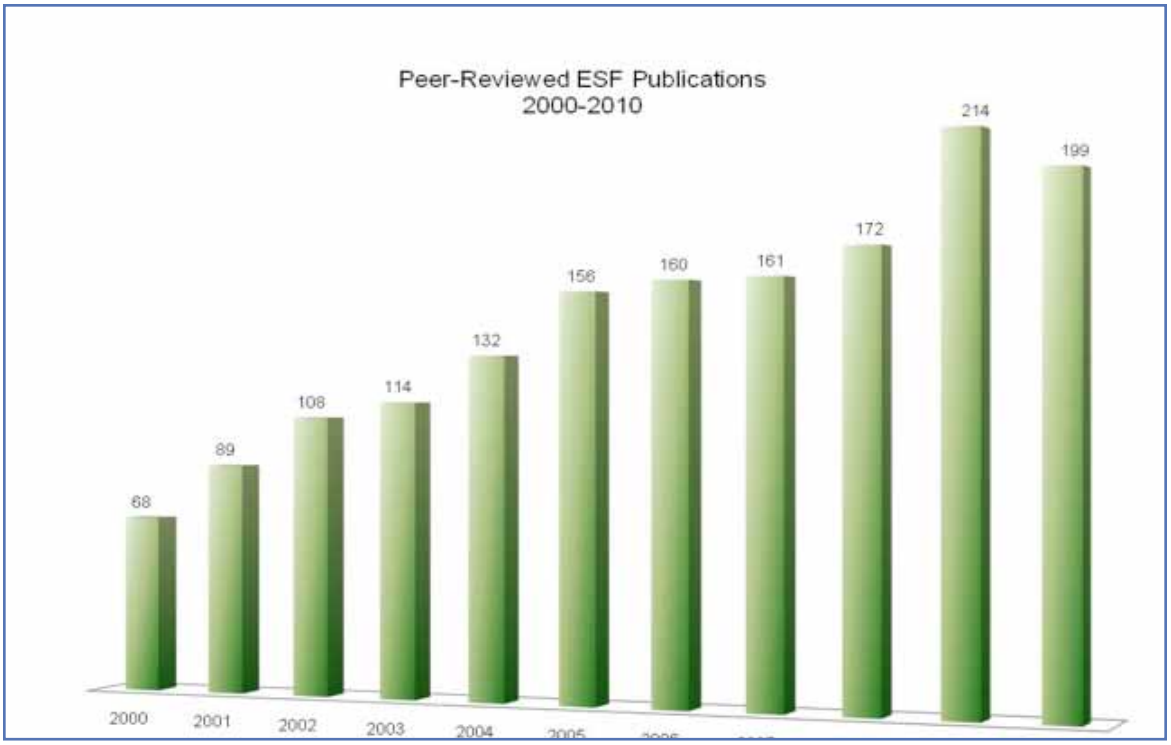


Figure 11. ESF Faculty Publications 2000-2010

Proposal success rate is another metric used to measure research performance. Overall, an enviable 62% of proposals submitted are funded. The rate exceeds 70% for proposals requesting less than $250,000. Above $250,000 success rate drops to about 20%, still a respectable number demonstrating faculty capability in research (Table 19 and Figure 12).

Proposal Submissions and New Funding Received
Fiscal Year 2010-11

Range	Proposals			New Funding			--Cost-Benefit--	
	Number	Amount	% Total Amount	Number	Amount	% Total Amount	Award # to Proposal # Ratio	Average Award Amount per Proposal
$1 - $10K	21	116,832	0.2%	15	70,673	0%	71%	3,365
$10K - $50K	63	1,711,006	2.3%	59	1,539,208	10%	94%	24,432
$50K - $100K	48	3,521,746	4.7%	34	2,373,547	15%	71%	49,449
$100K - $250K	41	6,879,173	9.2%	29	4,438,597	29%	71%	108,258
$250K - $500K	46	17,194,561	22.9%	9	3,227,395	21%	20%	70,161
$500K - $1M	14	9,353,240	12.5%	3	2,230,108	15%	21%	159,293
$1M - $2.5M	4	5,357,945	7.1%	1	1,470,000	10%	25%	367,500
> $2.5M	5	30,825,048	41.1%	0	0	0%	0%	-
Total	**242**	**74,959,551**		**150**	**15,349,527**		**62%**	**63,428**

Table 19. Submitted Proposals and New Awards Received 2010-2011

Further measures of research performance, including the number of research proposals, their dollar volume, yield (success) rate, average size, distribution among agencies, ARRA (Stimulus) funding and related statistics for ESF research activity are presented in Tables 19 and 20 and in Appendix 4.

	Strategic Priority	Actual 09/10	Proposed 10/11	Actual 10/11	Proposed 11/12
Office of Research Programs					
RF Expenditures	4	$14.6M	$15.6M	$13.4M	$16.6M
IDC Recovery	4	17.8%	21%	19.7%	18.3% (23% new awards)
Total Proposal Dollar Value Base Proposal Value (<$2.5M)	4	$79.2M ($54.1M)	$82M	$75.0M ($44.1M)	79.0M ($54M)
Proposal Number Base Proposal Number (<$2.5M)	4	274 (268)	280	242 (237)	260 (255)
Proposal Yield Base Proposal Yield(<$2.5M)		15% – 18.8% *	22% (25%)	20.2% (34.3%)	22% (30%)
New Award Dollar Value		11.92M	17.9M	$15.1M	$15M
Average New Award Value				$199K	$275K
ARRA Award		270.8K	1.65M	$1.47M	0

Table 20. Metric Goals

Specific responses to enhancing ESF's competiveness in sustainability research

Much of the research conducted at ESF has objectives and anticipated outcomes that are closely integrated with ESF's Principles of Sustainability (see Section VI: Sustainability at ESF). The College's AASHE STARS Report (2011) indicated that 74 of the 135 research-active faculty members were specifically engaged in research related to sustainability. In 2010-11, 30 sustainability-related projects (funded at $4,035,029) were in progress, and an additional 47 project proposals (requesting a total of $23,704,101) were submitted.

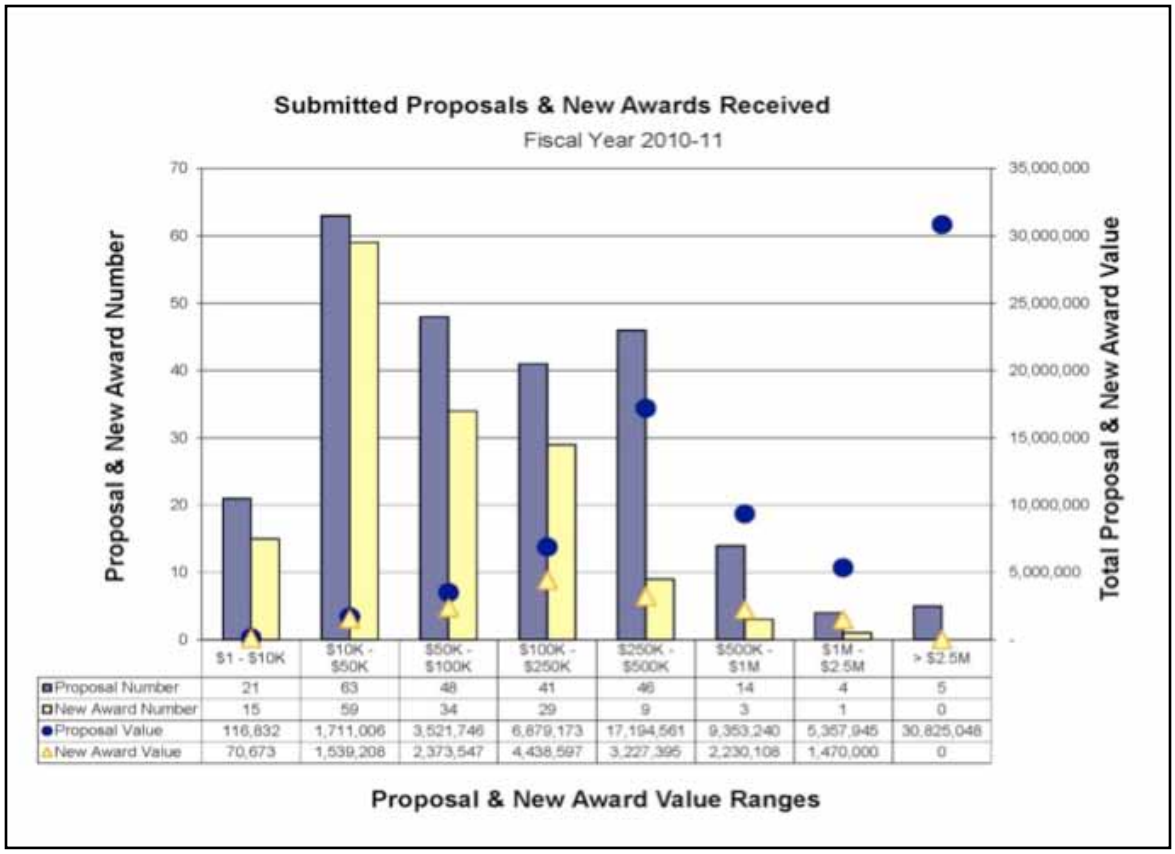


Figure 12. Submitted Proposals and New Awards Received 2010-2011

Based on a review of 2009-10 departmental annual reports, all academic departments had at least one faculty member involved in sustainability research that led to 74 journal articles, 11 books and 17 other reports as well as 120 conference presentations.

Sustainability-related projects can be largely grouped into the following categories:

- Studies on the complex inter-relationships that link human and natural ecological processes into regional, national and global ecosystems
- Forestry and fisheries/wildlife management practices that result in the sustainable development of natural resources
- Production of high yield, low environmental impact woody biomass for renewable energy and products
- The use of renewable resources, primarily woody biomass, for the production of fuels, chemicals and advanced materials that are both bio-based and biodegradable
- Alternative energy
- Concepts in the design of landscapes and communities that reflect the principles of sustainability
- Sustainable construction management and wood products engineering
- Lifecycle and economic analysis of the energy balance, CO_2 emissions and environmental impact of renewable resource development

Helping to advance the College's sustainability research are more than 32 departmental and inter-departmental Centers, Institutes, Councils and Consortia embedded within the academic organization. They attract funding and highlight the College's research enterprise.

They also enable the College to function as a much larger institution, leveraging resources across a broader base of investigators, in approaching sustainability challenges which are typically global in scale. They connect naturally with external constituencies such as private corporations, governmental agencies, local

communities, and non-profit organizations. Collaboration through ESF centers, institutes, councils and consortia promotes interaction among faculty members, which fosters sustainability research, literacy and technological competency across the undergraduate and graduate curricula. Those units focused primarily on sustainability in a broad context are listed below. Program descriptions can be found in Appendix 3 and on the web: http://www.esf.edu/research/ric.htm.

- Adirondack Ecological Center
- American Chestnut Research and Restoration Center
- Center for Community Design Research
- Empire State Paper Research Institute
- Council on Hydrologic Systems Science
- Herman L. and Gertrude Joachim Endowment Fund
- Center for Native Peoples and the Environment
- Randolph G. Pack Environmental Institute
- The Salix Consortium
- Center for the Urban Environment
- The State University of New York (SUNY) Center for Brownfield Studies
- SUNY Center for Sustainable and Renewable Energy
- Great Lakes Research Consortium

Additional institutes and centers are being developed and will be implemented during the coming years, including the Institute for Sustainable Materials and Manufacturing, and the Biorefinery Research Institute.

ESF's research facilities, support services, and infrastructural capabilities have been built to support research on ecological sustainability and the sustainable use of natural resources. Recent enhancements in research facilities include an $1.47M NSF-funded aquatic research laboratory, a 3800 sq. ft. biofuels pilot plant in the Syracuse Center of Excellence Building, and 10,000 sq. ft. of research space in the Central New York Biotechnology Research Center currently under construction. Other facilities and services of note are:

- Analytical and Technical Services (A&TS; High end multiuser instrumentation including: 300 and 600 MHz NMR, GC's, GC/MS, ICP, ICP-MS, MALDI-TOF-MS, Hi-Res MS)
- Radiation Safety Officer and Committee
- Scientific Diving Program Certification
- Human Subjects Institutional Review Board (IRB)
- Institutional Animal Care and Use Committee (IACUC)
- N.C. Brown Center for Ultrastructure Studies (Electron Microscope Lab - TEM, SEM)
- Paper and Bioprocessing Pilot Plant in Walters Hall
- F. Franklin Moon Library
- Cranberry Lake Biological Station
- Thousand Islands Biological Station
- Heiberg Memorial Forest
- Lafayette Road Experimental Forest
- Huntington Wildlife Forest
- Adirondack Ecological Center
- Great Lakes Research Consortium of 19 US and 9 Canadian members
- Pack Demonstration Forest
- UV /Electron Beam Processing Pilot Plant in Baker Lab
- Biofuels Pilot Plant and R&D Laboratory at the NYS Center of Excellence
- Future: Innovation incubator space at the CNY Biotechnology Research Center

The establishment of sustainability demonstration projects on ESF's campus, discussed in Chapter 10, also present a ready opportunity for sustainability research as most of the projects are pioneering and, therefore, to some degree experimental.

Progress on Opportunities

The College has made substantial progress on the research opportunities outlined in the 2007 Periodic Review Report:

a) *New Faculty.* Since 2005, the College has added a net of five faculty lines (130 vs. 135). Seven positions have been added through the SUNY Empire Innovation Program which is specifically designed to increase research capacity in the System by recruiting outstanding, proven research faculty. The College has used these hires to augment its sustainability research. The Empire Innovation Faculty include:

Dr. Huiting Mao (Chemistry): Modeling regional air quality including: regional tropospheric chemistry and climate change, intercontinental transport of trace gases and aerosols, climate-air quality connections, biosphere-atmosphere exchange of trace gases, and radiative transfer processes

Dr. Lee Newman (Environmental and Forest Biology): Phytoremediation, molecular and cellular biology

Dr. Theresa Selfa (Environmental Studies): Sustainable agricultural and food systems, community impacts of bioenergy development, political ecology, environmental governance

Dr. Philippe Vidon (Forest and Natural Resources Management): Water Quality, riparian zone/watershed biogeochemistry and hydrology, watershed management, best management practices, surface and subsurface hydrology, nitrogen, phosphorus, mercury, carbon cycling, greenhouse gases (N_2O, CO_2, CH_4)

Dr. Christopher Whipps (Environmental and Forest Biology): Epidemiology of viral diseases of fish and wildlife

Dr. Klaus Doelle (Paper and Bioprocess Engineering): Chemical engineering of products from renewable sources.

Dr. John Fieschko (Paper and Bioprocess Engineering): Director, CNY Biotechnology Center; Biotechnology, Bioprocessing, Biopharmaceuticals, Biofuels

b) *Reallocation of faculty positions.* The seven Empire Innovation hires were selected based on research priorities identified in the 2007 PRR. In addition, ESF added two faculty members as part of another special SUNY initiative, High Needs, which was created to add SUNY System capacity in engineering and nursing, areas identified as having insufficient graduates to meet employment demands. Both hires added to ESF's capacity in sustainability research as identified in the 2007 PRR. Those hires were:

Dr. Stuart Diemont (Environmental Resource Engineering): Ecological engineering, particularly in less technologically advanced societies.

Dr. Klaus Doelle (Paper and Bioprocess Engineering): Chemical engineering of products from renewable sources.

At the same time the College added nine faculty members in high priority areas through the Empire Innovation and High Needs programs, positions were lost in other areas.

c) *Financial resources for startup funds, seed grants and matches required for sponsored funds.* The College does not have large resources for faculty startups, although no faculty member has yet declined a position based on this issue. There are challenges in identifying and allocating startup funds. Much of the available funding comes from indirect recovery (overhead) on grants. Of the $2.3 M in indirect funds recovered in 2010-2011 only about $300,000 is available for discretionary purposes. The 2010-11 budget is provided in Appendix 5.

d) *Competitive abilities of faculty to get research funding.* In the past five years, the College has added seed grant and travel grants programs to aid faculty in initiating and conducting research, especially in new areas. The latest phase of the seed grants program is a new, collaborative seed grant program in

Environmental Medicine, including ESF, Upstate Medical University, Syracuse University and the Veterans Administration Hospital, which supplements ESF's existing seed grant opportunity that was established in response to the 2007 goals. In addition to the internal grants programs, the Office of Research Programs in collaboration with the Library, has added services to help faculty identify research funding opportunities. The Research Times, published monthly provides a list of RFPs that are current and related to faculty research interests. Further, faculty may request one-on-one assistance is finding research opportunities. The Research Office also funds faculty to attend research grant-writing workshops and organizes each January a faculty-wide mentoring conference which is typically attended by three-quarters of the College faculty. Several of the academic departments provide formal mentoring to new faculty members to aid in their research success. When adding new faculty the College specifically seeks individuals who are capable grant writers and project managers.

e) *Promotion of excellence in research through workload and reward policies.* Newly adopted Promotion and Tenure policies (2011) contribute to the goal of promoting excellence in research across the entire campus. A clearer recognition of standards and expectations, college-wide, will enhance research and scholarship expectations and accomplishments. The College has recently added an Exemplary Research Award to recognize and promote excellence in research. Presidential Merit Raises have also been used programmatically to provide financial rewards to high achieving faculty, over and above what is possible through the discretionary salary pool dictated by the labor-management agreement.

Challenges we face to reach these goals

Specific challenges facing the research community of ESF include:

- Recruiting sufficient faculty and associated expertise to submit competitive proposals that integrate scientific and engineering sustainability objectives, particularly that focus on lifecycle analysis of energy balances, process economics, rural economic development, the environmental and community impact of the proposed project, and other social science issues.
- The College has a strong tradition of recruiting faculty members to accomplish significant scholarly research, while at the same time contributing to the teaching program and to diverse college-wide needs. ESF is unlikely to transition to a mode in which research is the primary or sole responsibility of faculty members; the College does not have formally appointed Research Professors and very few Research Associates.
- While the cost of research will continue to rise, ESF's greatest research constraint for the research enterprise in the next 5-10 years is the high competition for reduced federal, state and private dollars. This reflects both global and national financial forecasts; SUNY Research Foundation has actually projected an overall flat rate of growth in research expenditures for the next five years. The approaches described in the last section of this report are intended to maintain a modest but steady growth in funded research activity; that is, ESF seeks to increase its market share in the research arena.
- A genuine challenge for a college of ESF's size is the level of indirect (overhead) funding generated. Despite high per capita productivity, the College is nearly at the bottom of the list of doctoral-granting SUNY institutions with regard to indirect funding; for example, about one-fourth that of SUNY Binghamton and one-fifth that of Upstate and Downstate Medical Centers. Yet, these funds are vital to stimulating new directions in sustainability research and they are among the most flexible of College financial resources for the research enterprise in general. Emphasis on grants from agencies allowing greater overhead recoveries is the major way by which this challenge will be met.
- Graduate student tuition, vital to most of the research programs on campus, is paid primarily through grants with little College subsidy. This has an adverse effect on the funds available to carry out the proposed research.
- Funding for New York State Graduate Assistantships, essential in supporting students in the first few years of study at ESF, has not kept pace with other institutions and this places an additional burden on research grants to provide competitive support.

- There has been a virtual elimination of "earmark" research funding (previously 10-15% of ESF research expenditures) by Federal agencies and a significant reduction by State governments. This has a double effect, because these funds supported sustainability programs and they provided a disproportionate share of flexible indirect funding (high indirect rates, particularly in comparison to state agency programs)
- The regionalization of technology transfer functions, which as of 2011 costs the College directly, without a compensatory reduction in Administrative costs from SUNY Research Foundation.
- Changing research priorities and funding through Federal agencies appropriate to ESF's forest-resource projects (USDA, USDA-National Forest Service, USDOE). A bias appears to remain by federal agencies against renewable wood-based vs. agricultural-based biomass as a source of energy, chemicals, and other bioproducts.
- Declining corporate R&D investments in some components of the academic research arena, especially in ESF's Paper and Bioprocess Engineering and the former Wood Products Engineering departments.
- Several departments (EFB, LA, PBE) are currently housed in aging buildings that lack important features for conducting research / design activities such as climate control, adequate bench space, waste handling and high quality water supplies. These aging facilities may inhibit recruitment of the strongest students in these programs.
- Aging Instructional Technology infrastructure, relatively limited technological support and the absence of a centralized scientific computing function.
- Limited capacity of the College to support the purchase, and particularly the maintenance, of high cost instrumentation such as Nuclear Magnetic Resonance instruments, Electron Microscopes, pilot plant equipment, watercraft and facilities at biological field stations.

Key Findings and Recommendations

Hiring and supporting outstanding scholars who embrace the College's mission is key to advancing the College's sustainability research agenda. The current ESF faculty is productive and accomplished. Their research is making substantial contributions to our understanding of how to sustain the natural environment and human societies. However, current challenges and a changing world require that the College take additional steps to augment its capacity and competiveness to engage in pioneering research. The following steps taken over the next 5-10 years will help the research enterprise at ESF build on its current success. These initiatives will be vital to enhancing the ESF footprint, both in recognition and in financial support.

- As was done with the Empire Innovation and High Needs programs, search for and hire sets of faculty to include biological and physical scientists, engineers, landscape architects and social scientists who can integrate our sustainability research and academic programs.
- Consider new ways to facilitate spousal hires, e.g. through active programs with nearby SUNY and private colleges and universities. The ESF-wide approach to the search and selection process seemed highly desirable and effective.
- Determine the potential research productivity and financial flexibility provided by a net gain of one or more new faculty per year over the next ten years.
- Increase emphasis on the success of large, multi-institutional collaborative proposals. Although proposal numbers (260/year) and success rates (30% on proposals < $2.5 M are quite high, relatively few large and long-term proposals have been funded.
- Create incentive programs for Centers, Consortia and Institutes to develop collaborative, competitive research proposals, and continue to strive for formal partnerships with existing, private entities such as Upstate Freshwater Institute and the Onondaga Environmental Institute.
- Sponsor a college-wide retreat/event that highlights the Centers/Institutes/Consortia and brings state

and national legislators to the College. Recognize a Center or Institute annually with a desirable and visible award.

- Work with private corporations, such as Honeywell, to further promote support of research and graduate programs, and with the ESF Development Office on new modes of support for research, startup, and seed grants.
- Develop programs similar to the new Environmental Medicine/Hill collaboration, in which modest annual contributions by ESF, SU, UMU and the VA Hospital are used to stimulate teams to pitch collaborative proposals to major funding agencies such as National Institutes of Health.
- Develop venues for ESF faculty and staff to brainstorm together in looking to future research areas that are vital to global health and sustainability, and within the reach of College resources, vision and goals.
- Actively pursue ESF research connectivity with the SUNY system, which represents the fourth largest university system in the United States in research expenditures. New programs with Binghamton University in technology transfer and with Upstate Medical University in Environmental Medicine are current examples; additional opportunities exist to include SUNY Buffalo, Stony Brook and Albany. Research proposals that highlight the "Power of SUNY" are likely to receive enhanced attention from granting agencies.
- In the next version of the ESF Promotion and Tenure guidelines, consider adding a sustainability parameter to the teaching, research or outreach responsibilities of each faculty member.
- Add a sustainability criterion to the annual Exemplary Researcher Award, or create a new award to include a seminar and recognition ceremony.
- Establish linkages between ESF's research programs and the AASHE STARS program to increase student and staff involvement with campus-wide sustainability issues (Sustainability Tracking, Assessment & Rating System is a program that measures and encourages sustainability in all aspects of higher education, see Section IV for more information about STARS).
- To foster cross-campus awareness and collaboration in sustainability research, establish a Faculty seminar series and add a sustainability section to the student "Spotlight on Research" annual poster symposium.
- Use the existing Seed Grant programs to catalyze new research programs in sustainability.
- Continue to provide formal grant proposal writing training on an annual or more frequent basis, and provide attractive travel opportunities for promising young scholars (or scholars entering new research areas) to attend targeted grant-development workshops.
- Through indirect funding and perhaps private (Development) support, strengthen linkages with those groups in the US Forest Products Industry with responsibility for strategic visioning and sustainability initiatives. Maintain representation on USDOE, USDA, and Forest Service panels that establish and "roadmap" research priorities. Provide travel support and recognition for this activity.
- Work with the ESF Foundation to identify opportunities for funding specific research initiatives through the ongoing Centennial Campaign.

Chapter 10. Sustainability Goal 3 – Demonstration – Champion sustainability through on-campus demonstration of sustainable practices

Since its founding in 1911, ESF has been responding to the needs of society and the environment by providing guidance through leadership, research, demonstration and outreach in accordance with the issues of the time. ESF faculty, students and graduates helped establish the profession of forestry and provided expertise as the country recovered from decades of deforestation in the early 20th century. During the Great Depression, they provided assistance to the Civilian Conservation Corps and other government agencies that managed environmental projects including park development and forest restoration. After World War II, ESF helped promote environmentally sensitive land use and management activities. As the issues of energy use and climate change have come to the forefront of contemporary society, ESF is again assuming a leadership role by demonstrating solutions to a diverse number of environmental issues relevant at local, state, national and international levels.

Seeking to move beyond teaching about the environment, the College set the goal of becoming a model for environmentally sensitive development and living. In other words, the College aims to practice what it teaches.

The foundation for this aspiration was established by the adoption of the Vision 2020 strategic plan in 2003. This document established strategic goals in seven areas vital to the growth of the institution (see Chapter 6, Strategic Planning and Progress at ESF).

Each goal included specific targets to be achieved by 2020. While many of these targets were policy related or programmatic in nature, Goal 7: "Investing in ESF's human resources and physical infrastructure," is particularly relevant to the application of sustainability. Several targets within this goal require physical manifestation on campus or affect operations and maintenance activities.

As a part of the development of the Vision 2020 plan, the mission of the College was stated thusly: "To advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments." This statement succinctly ties the education, research and outreach functions that have always been part of the institution to the idea of sustainability. To that point, a key value identified in the strategic plan is the commitment "to sustainable practices and policy alternatives that will both protect the environment and meet the needs of a global society."

In assessing progress toward these strategic goals and targets, the College reflected on opportunities to model sustainability identified in the Periodic Review Report to MSCHE:

a. Develop campus master plan in which sustainability is a core objective
b. Use new building construction and building renovations as opportunities to advance campus sustainability
c. Transition campus energy sources from fossil fuels to renewable sources (including solar, wind, and biomass)
d. Achieve campus-wide carbon neutrality by 2015
e. Allocate resources to a campus sustainability coordinator charged with seeking opportunities to improve sustainability in campus operations and with coordinating activities of faculty, staff, and students that promote behaviors that advance sustainability

Building upon this, in 2007 several significant steps were taken by the campus to advance sustainability both on campus and nationally. In that year, ESF served as one of 66 institutions that participated in a pilot study for the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment & Rating System (STARS). This system is a point-based metric aimed at gauging relative progress toward sustainability for colleges and universities, and is intended to become a national standard for institutional assessment. The results of that study have helped AASHE refine the STARS system and given the institution valuable feedback on areas it can improve upon.

Also in 2007, ESF became a charter signatory of the American College & University Presidents' Climate Commitment (ACUPCC). This initiative seeks to address global warming by harnessing the leadership of colleges and universities across the country through commitments to eliminate greenhouse gas emissions, integrate sustainability into curricula, and accelerate the research needed to address climate change. One of the mandates of this commitment is the establishment of a target date for achieving carbon neutrality. ESF President Cornelius B. Murphy, Jr., set an ambitious target date of 2015 for the College to attain this goal.

To be consistent with the notion of "practicing what we teach," a key aspect of the institution's approach to achieving this goal is true carbon neutrality, facilitated by carbon dioxide reductions and sequestration rather than by offsetting emissions through purchased credits. To the greatest extent possible, ESF will become carbon neutral through reductions of energy use, and fossil fuel emissions as part of changes to operations and maintenance activities, and through sequestration on forest properties.

This chapter relates most directly to portions of MSCHE Standards 1, Mission and Goals; 2, Planning, Resource Allocation, and Institutional Renewal; and 3, Institutional Resources.

Where do we want to go?

Consistent with the Vision 2020 and the campus sustainability plan, ESF set ambitious goals for the ongoing development of demonstration projects to provide sustainable and reliable resources while supporting the College's teaching and research needs. These goals are summarized below:

- Develop campus master plan in which sustainability is a core objective
- Achieve campus-wide carbon neutrality by 2015
- Use new building construction and building renovations as opportunities to advance campus sustainability
- Transition campus energy sources from fossil fuels to renewable sources (including solar, wind, and biomass)
- Allocate resources to a campus sustainability coordinator charged with seeking opportunities to improve sustainability in campus operations and with coordinating activities of faculty, staff, and students that promote behaviors that advance sustainability
- Achieve "green campus" distinction
- Implement a campus physical facilities plan to include new and renovated space
- Incorporate renewable energy resources and energy management systems
- Expand College properties contiguous to the Syracuse campus

Sustainability Initiatives Continue to Build on ESF's Vision 2020

Existing and future demonstration initiatives build a base for continued research and education of ESF students and outreach to the broader community. ECN 2015 envisions 40 initiatives focused on meeting the campus carbon neutrality goal by 2015. They represent a 13,000 ton reduction and offset of CO_2 emissions, while reducing purchased electricity by 70 percent and purchased fossil fuels by 65 percent (see Figure 13). ESF selected a diverse set of demonstration projects, and provided data capture methods for most of them as a means of enriching the academic experience for ESF students, while providing opportunities for students to engage in changing the campus (e.g., produce biodiesel, develop composting systems, deliver a climate action plan) and enhancing the College's experiential learning capacity (Vision 2020 goals 1 & 2). ESF engages with the community and business partners as the "go-to" institution to observe a wide variety of technologies in use, to learn how to implement them to meet the needs of society, and to address issues of human impacts on the environment (Vision 2020 Goals 3, 5 & 6). Finally, these projects, while beneficial for the environment, will help ESF remain financially secure. Energy costs represent a significant portion of the variable costs in the ESF budget. The sustainability initiatives focused on energy are designed to reduce ESF's energy costs by more than 25%, and by shifting away from fossil fuels, the College will also reduce its exposure to the volatility inherent in those costs.

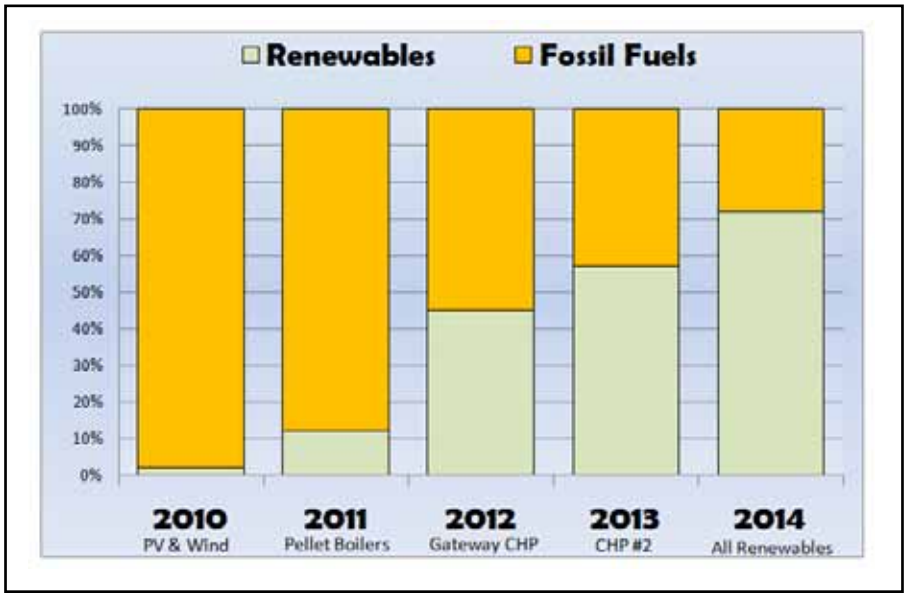


Figure 13. ESF Fuel Trend Mix (From ECN 2015)

Represents the total projected fuel use mix for ESF from 2010 to 2014. ESF is poised to transition from energy use dominated by fossil fuels to a 70:30 mix in favor of renewable energy in the next five years.

The Cornerstone of ESF's Climate Plan – the Gateway Building and Combined Heat and Power Project

ESF's commitment to sustainability and carbon neutrality will be significantly advanced and highlighted in the Gateway Building, scheduled for competition in 2012. Drawing on in-house expertise in sustainable construction and renewable energy systems, ESF has worked with the design team led by the architecture firm Architerra Inc. to create a unique and progressive facility.

The building will be developed to exceed LEED Platinum standards and will emphasize several key sustainability principles, including maximizing the use of natural ventilation to minimize use of air-conditioning and creating a comfortable, naturally day-lit environment that relies less on electrical illumination. Additionally, the Gateway Building will include a biomass-fueled combined heat and power energy system and a target building energy intensity of 39 kBtu/sq ft/year or less. This is well below the baseline standard for energy use in this type of structure (88 kBtu/sq ft/year).

As it pertains to energy use and carbon emissions, the construction of the Gateway Building will allow ESF to:

- Reduce fossil fuel dependence by incorporating an energy system that offsets existing campus fossil fuel use by outputting more renewable energy than the building consumes
- Reduce the campus carbon footprint by offsetting more emissions than the building generates
- Showcase and test renewable energy systems and innovative efficient building techniques
- Effectively use sustainable local biomass to meet campus energy needs
- Reduce and stabilize campus energy costs
- Create a building that teaches, inspires, and improves campus life
- Have a physical representation of ESF's academic programs and institutional commitments to sustainability

Building Energy Systems

The crucial component to meeting the institution's carbon neutrality goal is the Gateway Building energy systems. This building will use an interconnected mix of passive and active energy systems, housed and fully integrated within the Gateway Building itself.

At the system's core is a large wood-pellet steam boiler. The boiler is connected to a backpressure turbine that converts high-pressure steam into electricity while reducing pressure. Three natural gas fired micro-turbines provide additional electricity generation, and are tied into the system's heat recovery system. A large roof-mounted photovoltaic array may be added to the system. Solar thermal applications have been retrofitted to the system.

The system is intentionally designed to output significantly more energy than the Gateway Building will consume, allowing excess heat and electricity to be used in Moon Library, Illick Hall, Jahn Lab and Baker Lab. Output from the system will cover approximately 70 percent of the campus heating needs, and 22 percent of the campus electrical needs. The bulk of the system is powered by renewable fuel sources, and the remaining components are a significant improvement in efficiency compared to traditional purchased electricity and steam. The systems will significantly reduce ESF's carbon footprint and fossil fuel dependence, resulting in a 22 percent carbon footprint reduction (2,700 $MTCO_2e$/yr.).

Where are we now?

Overview of Sustainability Initiatives

ESF laid the groundwork for its energy-reduction and sustainability initiatives in the first few years of the new millennium. In 2002, ESF received a $2.5 million grant to install one of the country's first fuel cells, a 250 kW molten carbonate fuel cell. In 2003, the College hosted a conference to explore the feasibility of creating a New York State Energy Conservation/Global Warming Consortium. ESF made a commitment to becoming carbon neutral by signing the American College & University Presidents' Climate Commitment (ACUPCC) in January 2007.

This Commitment prompted ESF to fast-track its carbon-reduction initiatives. Over the next two years, the College established the Campus Climate Change Committee (CCCC), planted a green roof on Waters Hall, began the biodiesel production program, installed solar arrays on Baker Laboratory and Walters Hall, completed its first greenhouse gas inventory, and established the Office of Renewable Energy Systems to focus on sustainability issues. All of these programs relied heavily on participation from students as well as faculty, staff and administrators. In 2006 and 2007 ESF implemented several academic initiatives to engage students and the community with energy demonstration projects at the Syracuse campus. These included SPARE – Solar Power As Renewable Energy, a four-day program that teaches traditional and non-traditional students to site, design, and install photovoltaic systems, and SURE – Sustainable Use of Renewable Energy, a series of workshops that teach members of the community about renewable energy issues and decision-making.

In 2008, ESF continued investing in sustainability programs that would benefit its students and members of central New York. On campus, the College launched a renewable energy minor; installed a rain garden that reduces storm water runoff from Illick Hall; implemented porous pavement in bike parking areas and at the entrance of Moon Library; received a grant from the Kauffman Foundation to study the feasibility of developing a green energy cooperative based on its biodiesel production; and piloted the Sustainability Tracking, Assessment & Rating System (STARS), a self-assessment of ESF's sustainable practices. In an effort to engage the surrounding community, ESF began the Green Entrepreneurship annual seminar and started a weekly "Going Green" TV segment that is hosted on Time Warner Cable's news channel.

Throughout 2009 the College increased communication about its sustainability projects and decreased campus carbon emissions. The College developed its sustainability webpage that links directly from the

homepage. The site lists the institution's major accomplishments related to sustainability and continues to be updated on a regular basis. A team of faculty, staff and students developed and submitted ESF's Climate Action Plan to be carbon neutral by 2015 to the ACUPCC public reporting database. In addition, in an effort to reduce greenhouse gas emissions, ESF installed an alternative fuel fueling station for campus and community vehicles, partnered with Syracuse University to launch CuseCar, a car-sharing program for members of both institutions, and removed half of the light bulbs in Illick Hall (a process known as de-lamping).

The following year, 2010, was characterized by large-scale improvements, measurements, and official sustainability policies. A wind turbine was installed to help power remote classrooms at the College's Heiberg Forest campus in Tully, New York; a class in the Department of Environmental Studies completed ESF's second greenhouse gas inventory; and ESF became a Charter Member of the officially-launched STARS program. Administrative offices of ESF implemented their first office/unit level sustainability action plans (Appendix 6). Porous paving was installed to reduce storm water runoff from a campus parking lot and contractors broke ground on two new green buildings – the Gateway Building and Centennial Hall – which will pursue LEED Platinum and Silver distinctions, respectively. Student-initiated projects completed in 2010 included the de-lamping of Moon Library and an extensive composting program. New institutional policies related to sustainability addressed waste reduction, purchasing sustainable cleaning products, soil erosion, purchasing reduced mercury light bulbs, sustainable management practices for campus grounds, and use of natural lighting.

In 2011, ESF continues to expand its campus commitments to sustainability and to reducing greenhouse gas emissions. In April, ESF completed its STARS assessment and received a Silver Rating. The STARS assessment was largely completed by students. A biomass boiler was installed at the Ranger School, and the College received a $963,000 grant for the Gateway Building's Combined Heat and Power Project, installed solar arrays on Moon Library and the Adirondack Ecological Center, launched a ride-share program with Syracuse University, and implemented energy efficiency measures based on an audit completed through the New York Power Authority. ESF students broke ground on a new campus organic garden that will serve as an educational tool and provide food for local food pantries. An open forum for students on sustainability offered a great discussion of current activities and resulted in a long list of other actions the College can pursue (Appendix 7). The College also installed a self-serve bicycle maintenance station on campus for use by students and faculty. A ride sharing web based software system "Rideshark" was also adopted in 2011. Furthermore, two new sustainability policies were adopted in 2011 (http://www.esf.edu/sustainability):

- Solid Waste Reduction and Recycling Policy
- Sustainable Cleaning Products Purchasing Policy
- Reduced Mercury Light Bulb Purchasing Policy
- Low-Impact Site and Green Building Exterior Management Plan
- Erosion & Sedimentation Policy
- Space Churn Renovation Plan and Policy
- Campus Building Temperature Policy
- College Smoking Policy
- Instituted Green Cleaning Procedures per NYS executive order 134, which directs NYS agencies to reduce the environmental impact of cleaning of state facilities.

Sustainable Initiatives focused on Energy

The College created an Office of Renewable Energy Systems to focus on expanding the use of sustainable technologies and increase energy efficiency to reduce the College's carbon footprint. The College initially hired a director and then added a professional position to the office as an additional resource. The office monitors the energy and water purchased by the College. ESF has initiated many energy saving projects with the support of Physical Plant & Facilities staff and the Office of Renewable Energy Systems.

ESF established 2007 as a baseline year to evaluate its progress in changing energy use and adoption of sustainable energy sources. ESF used approximately 184,394 MMBTU of energy in 2007. Figure 14 indicates the energy use patterns of the College during the baseline period. The ESF Climate Action Plan (ECN 2015)

indicates that approximately 69 percent of the campus energy used in 2007 was for electricity and steam, which are both off-campus, Scope 2 emissions areas. This significant percentage highlights the need to make energy an area of primary focus for campus initiatives. On-campus (Scope 1) energy use accounted for nearly 16 percent of overall energy use, and Scope 3 use was approximately 15 percent.

Scope 1					Scope 2		Scope 3		
Distillate Oil	Natural Gas	Propane	Gasoline	Diesel	Electric	Steam	Commute	Air Travel	Scope 2 T&D
7,342	18,047	718	2,608	533	52,075	75,199	8,242	4,213	15,405

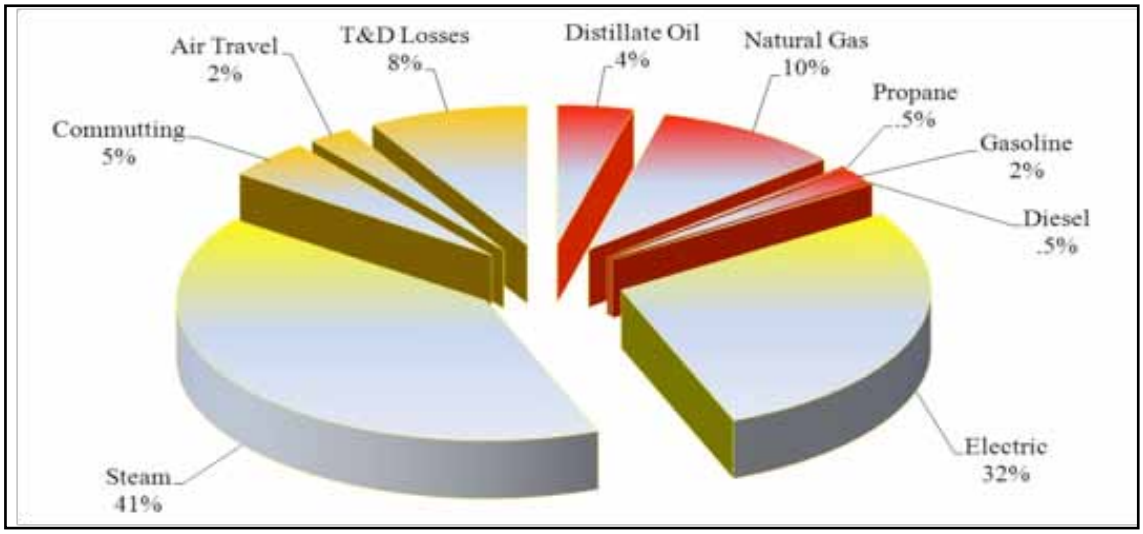


Figure 14. ESF Energy Inputs – 2007 (MMBTU energy) (From ECN 2015)

Scope 1 shows inputs from direct combustion on campus, Scope 2 depicts inputs purchased by ESF which have off-site emissions, and Scope 3 illustrates inputs not purchased by ESF directly but required for campus functions.

Prior to the ECN2015 study, the College recognized that mitigating and reducing the use of energy generated from non-renewable sources is a key factor in achieving sustainability goals. As a result, many of the initiatives implemented on campus between 2007 and 2009 were done with the express purpose of reducing ESF's dependence on traditional grid-based energy systems. During this period ESF completed the installation of:

- 250 kW molten carbonate fuel cell (Walters Hall on main campus)
- 25 kW photovoltaic array (Baker Laboratory on main campus)
- 15 kW photovoltaic array (Walters Hall on main campus)
- 5 kW wind turbine (Heiberg Memorial Forest and Tully Field Station)
- High-efficiency chillers (Illick Hall and Walters Hall on main campus)

ESF also increased its biodiesel production during this period. Biodiesel produced from fryer oil used by Syracuse University campus food services and from the student butter sculpture created at the New York State Fair powers campus vehicles.

The College implemented a new campus building temperature policy in 2008, which is monitored by a building energy management system. The College also developed a summer energy saving initiative in which staff use flex-time, allowing the college to close early on Fridays during the summer months to reduce energy use. In addition, ESF offers flexible leave during the December holiday period to reduce the need to heat building spaces during this time.

An energy-saving student initiative called the "Lights Out Campaign" encourages staff, faculty and students to turn off lights in unoccupied spaces. Students counted the campus light switches, then designed and installed "lights out" stickers at each light switch on campus. Students also conducted a study of Moon Library lighting to develop a de-lamping plan for the space, which was then implemented by the Physical Plant custodial staff.

In addition to increasing alternative energy sources on campus, an energy audit revealed numerous opportunities for energy use reduction through conservation measures. These include upgrades to campus equipment using more energy efficient technologies. In conjunction with these measures, the Department of Renewable Energy Systems and the ESF community have identified several opportunities for substantial reductions in greenhouse gas (GHG) emissions. Most of the energy conservation measures are scheduled for installation in Fall 2011 and most of the alternative energy projects were completed in 2010-11, as per the lists below.

Energy Conservation Measures

- Variable-frequency drives on chill water pumps (Jahn Laboratory)
- Metal halide re-lamping
- Vending machine sensors
- High-efficiency motors
- Efficient lighting upgrade (Newcomb campus)
- Radiator steam trap replacement
- Variable-frequency drives
- Occupancy sensors
- De-lamping existing lighting (completed in 2010-11)

Alternative Energy Projects

- 25 kW photovoltaic array (Moon Library)
- 25 kW photovoltaic array (Tully Experiment Station) – scheduled Sep 2011
- 25 kW photovoltaic array (Newcomb administration building)
- Wood pellet boiler (Ranger School)
- Vertical axis wind turbine

Energy use reduction on campus was the second most common theme of comments submitted throughout the self study feedback process (31 comments), most relating to building retrofits, lighting, and IT improvements.

Sustainable Initiatives focused on Campus Grounds

The Physical Plant Grounds Department uses an integrated pest management plan. The college limits the use of pesticides on campus, and Physical Plant must receive approval from the Office of Environmental Health & Safety and the VP for Administration prior to applying them. The College's Low-Impact Site and Green Building Exterior Management Plan encourages the use of native plant materials, limits landscape waste and irrigation, and establishes guidelines for snow removal on campus. Additionally, a Natural Northwood Wildlife Habitat was created by faculty and students between Illick Hall and Moon Library which is used for class instruction. ESF also plans the gradual replacement of turfgrass, particularly on sloped and hard to maintain areas, to reduce maintenance costs and emissions.

Sustainable Initiatives focused on Purchasing

The College has policies in place for the purchase of Energy Star products, green cleaning products, mercury-free devices and reduced mercury light bulbs. In addition, the campus purchases paper with recycled content in accordance with State policy.

Sustainable Initiatives focused on Transportation

A mandate by the State of New York to purchase energy efficient and alternative-fuel vehicles per Executive Order No. 142, enacted on November 21, 2005, directed state agencies and authorities to diversify transportation, fuel, and heating oil supplies through the use of bio-fuels in state vehicles and buildings. This executive order was recently rescinded; however, ESF continues to operate using biofuels as part of its fuel mix.

The College currently has 29 alternative fuel vehicles out of the total fleet of 73, and the shipping and receiving department uses a bike to transport packages around campus. Biodiesel, which is manufactured on campus by students, is used in the college's diesel vehicles. ESF's students walk, use bikes and ride a free campus shuttle as primary sources of transportation, particularly in and out of the university neighborhood. Additionally, the parking policy recently endorsed by the Board of Trustees gives preferential parking for carpooling and low-emission vehicles, supporting overall campus sustainability goals.

Sustainable Initiatives focused on Waste Reduction

The Physical Plant administers a campus recycling program for paper, cardboard, bottles, cans, plastics, fluorescent light bulbs, batteries, electronics and scrap metal to divert these items from the campus waste stream. In addition, the student-run Green Campus Initiative maintains a campus composting program, and it has been recommended that grounds staff mulch grass and leaves back into the landscape. The Office of Environmental Health and Safety maintains a hazardous waste management program on the campus. Students in the Green Campus Initiative (http://www.esf.edu/org/gci/) conduct an annual campus waste audit to build awareness in the ESF community about the need for continual attention to waste reduction. Reducing waste on campus was the most commonly mentioned theme of comments submitted throughout the self study feedback process, with twenty-six of the 57 comments focused on using less paper.

Sustainable Initiatives focused on Water Consumption and Stormwater Management

The College installed water-saving faucets in several campus buildings and is investigating the use of gray water in new construction projects. In addition, the College has a water collection system (a cistern) for the Baker roof run off. The water is collected, filtered and used to wash college vehicles and water campus flower boxes. The College's motor vehicle garage staff and grounds staff support these efforts. ESF does not have a campus irrigation system for campus lawns, and only waters during extreme droughts, which are uncommon in the Central New York area.

The College has also adopted a significant number of storm water management features, including:

- Erosion and Sedimentation Administrative Policy #23 – 11/1/10
  Requires a storm water protection plan plan for all construction projects
- Green Roof on Walters Hall
  7,200 ft2 of primarily sedum species
- Illick Roof Modifications to direct 7,575 ft2 of generated stormwater to a rain garden located on the southeast corner of Illick
- Renovation of Baker Laboratory to direct stormwater flow from 6,512 ft2 of the roof to four 1,000 gallon storage tanks in the basement of Baker, which is used in washing vehicles and watering plants
- Use of Flexipave (porous pavement) on campus at three locations for a total of 2,462 ft2
- Use of asphalt-based porous pavement in the Parking and Site Improvements project located northeast of Bray Hall involving 11,066 ft2

- Installation of a rain garden associated with the Parking and Site Improvements project to take stormwater flow from 50% of the parking area
- Installation of six rows of below grade 36" HDPE storage to collect stormwater from the Parking and Site Improvements project to store and equalize the flow of stormwater from the parking area

It is estimated that during an average 1" per every 2 hours rain event approximately 40,000 gallons of stormwater is captured for reuse, directed to ground water recharge, or filtered through drainage media. This helps to reduce the quantity or delay peak flow from the storm system into the municipal systems and contributes to the City and County efforts to reduce combined sewer overflows (CSOs). The new Gateway Building will have a green roof (~50% of the roof area), a small subterranean storage tank, a vortex separator, and rain gardens to the north and south of the building, which are expected to manage 100% of the stormwater runoff generated by the new building. Centennial Hall also has infiltration basins to help manage its stormwater.

Sustainable Initiatives focused on Forest Management for Carbon Sequestration

Net reductions of carbon dioxide (CO_2) emissions can be achieved by reducing direct emissions from carbon sources as well as by removing CO_2 from the atmosphere through plants' natural processes of photosynthesis and storage as biomass (also known as sequestration). While there are differences in time, cost and implementation of these techniques, these methods produce the same result, where one ton of carbon dioxide removed permanently from the atmosphere through sequestration is equivalent to preventing one ton of carbon dioxide emissions into the atmosphere.

The American College & University Presidents' Climate Commitment (ACUPCC) allows schools to account for the carbon sequestered on college-owned forest lands in their carbon inventories as they seek to meet carbon neutrality goals. These forests and their management must meet the standards set by the Greenhouse Gas Protocol Initiative in their document *Land Use, Land-Use Change, and Forestry (LULUCF) Guidance for GHG Project Accounting* (Dautremont-Smith, et al. 2007; Greenhalgh, et al. 2006).

ESF is in the unique position of having extensive wooded property holdings that can facilitate sequestration strategies. Off the main campus, the College has acquired properties totaling 24,519 acres throughout central and northern New York State. These properties have been acquired from a variety of sources. Some were acquired by the state of New York as Reforestation Areas under the Hewitt Act and subsequently transferred to the College. Others were gifted for a variety of purposes and are used in academic programs.

A percentage of these 24,519 acres is not actively managed or utilized. This area will be the focus of sequestration efforts that will form a part of ESF's plan to achieve carbon neutrality by 2015.

ESF Carbon Sequestration Assessment

In 2009, ESF undertook a preliminary assessment of the amount of carbon sequestered by College forest properties on an annual basis. This analysis assessed the annual above-ground carbon storage using continuous forest inventory data from more than 600 permanent and nearly 400 temporary re-measurement plots. These plots were established between 20 and 40 years ago across six properties.

From the gross forest acreage (24,519 acres) the area of land under water, rock outcroppings, forest roads and other non-vegetated terrain was deducted. Also deducted were those areas that had been institutionally or legislatively protected at the time of their acquisition by the College. This left a net acreage of 17,103 acres.

The biomass of all sampled stems one inch in diameter at breast height or greater was computed using species group biomass equations (Jenkins et al. 2003). These estimates include all above-ground live biomass and live coarse roots more than 2.5 inches in diameter, though root data was excluded from the final analysis. The inventory records indicate the fate of each individual stem, including which stems were harvested or died. Any new infill growth was also recorded, including any stems reaching one inch or greater in diameter over the last 10-year re-measurement period in the analysis. Biomass estimates were converted to carbon estimates using the factor of 50 percent carbon.

These base-year carbon stocks were then projected forward using a forest growth model (NE-TWIGS). This was calibrated to mimic the actual growth rates measured in the continuous forest inventory plots and included simulated forest management interventions in order to estimate net annual sequestration levels over a 100-year projection period.

Results of our analysis suggest that the ESF forest properties sequester approximately 37,461 metric tons of CO_2 equivalents per year (see Table 21).

Annual Above Ground Forest Carbon Storage on the ESF Forest Properties								
Forest	**Gross Ac**	**Less Prior Protected**	**Less NC/IO**	**Net Ac**	**AGB/ha**	**AGB/ac**	**$MTCO_2e$/ ac/yr**	**$MTCO_2e$/yr**
Tully Field Station	60	60		0		0.00	0.000	0.0
Governor's Island	3	0	3	0	0	0	0.000	0.0
LRES	44	0	12	32	1.8	0.71	2.598	83.1
Pack Experimental Forest	894	0	100	794	1.5	0.59	2.165	1,718.4
Heiberg Memorial Forest	3,331	1,680	165	1,486	1.7	0.67	2.454	3,646.7
Dubuar Memorial Forest	2,732	0	384	2,347	1.2	0.47	1.732	4,066.4
Pack Demonstration Forest	2,415	0	234	2,181	2.1	0.83	3.031	6,612.0
Huntington Wildlife Forest	15,040	0	4,777	10,263	1.4	0.57	2.079	21,333.9
TOTAL	**24,519**	**1,740**	**5,676**	**17,103**	**1.6**	**0.6**	**2.3**	**37,460.6**
TOTAL EMISSIONS								12,145.0
EMISSIONS - SEQUESTRATION								-25,315.6
SEQUESTRATION %								308.4

Table 21. Annual Above Ground Forest Carbon Storage on ESF Forest Properties

Note: LRES = Lafayette Road Experiment Station; Governor's Island is the site of the Thousand Islands Biological Station; Pack Experiment Forest is site of Cranberry Lake Biological Field Station; Dubuar Memorial Forest is the site of the ESF Ranger School; Pack Demonstration Forest is the site of the New York state DEC Environmental Education Camp; Huntington Forest is the site of the Adirondack Ecological Center

Applying Carbon Sequestration at ESF

While the numbers are preliminary, they suggest that the amount of above-ground sequestration taking place on the ESF regional campuses is likely to be sufficient to offset more than 300 percent of the College's gross CO_2 emissions. This potential must be tempered with a practical assessment of the issues, operations and contextual influences of these properties.

As the majority of the forest properties are managed as part of the institution's standard academic practices, and would continue to grow and sequester carbon regardless of whether the school was focused on climate issues or not, it would be inappropriate to count this as "additional" sequestration to meet carbon reduction goals. This is particularly true for the Huntington Wildlife Forest, the Pack Experimental Forest and the Dubuar Memorial Forest. As such, ESF should not count the sequestration volume on those properties as a surrogate for other significant emission reduction efforts.

However, several of the properties exist in another context entirely, having been dedicated in whole or in part to the public demonstration of forest management techniques. Valid arguments exist for including the forest growth and additional sequestration potential on 2,181 acres (90% of the site) of the Charles Lathrop Pack Demonstration Forest in Warrensburg, N.Y., and on approximately 1,486 acres (45%) of the Heiberg Memorial Forest in Tully, N.Y.

This argument is based on the premise that if an entity other than ESF possessed the land it would likely be used for agriculture, housing development, or resource extraction, which result in no net carbon sequestration. Considering the analysis techniques explained above, there is a potential sequestration capacity of 10,259 MT CO_2/year at these two sites.

This is a reasonable and feasible amount of sequestration potential and would help the institution meet its carbon neutrality goals. In the accounting toward carbon neutrality performed under ECN2015, ESF would only need to sequester 7,000 MT CO_2/year to meet its goals.

Further studies are currently under consideration by ESF faculty, staff and students to more precisely determine the amount of potential sequestration on these properties. These studies are conducted using other protocols (e.g. those of the Chicago Climate Exchange) to determine actual sequestration volumes and to further verify conformance to the LULUCF guidelines.

These studies will guide management strategies and inform how much of ESF's property will be utilized for the purpose of carbon sequestration. If necessary, increases could be made in the amount of campus property that is managed for sequestration. Based on the initial analysis and ongoing studies, ESF is confident it will meet its minimum requirement of 7,000 MT CO_2/year.

Challenges we face to reach these goals

General institutional challenges and relationship to these goals

Sustainable technology demonstration projects have impacts on operational resources that can both require additional resources and reduce operational resources. These projects are like most applied research that adds equipment and technology to a campus, they require resources to maintain and operate the equipment. However, in the case of many energy projects (and some other sustainability projects), there are operational savings that more than offset any increase in operations and maintenance costs. Energy savings are the largest source of potential savings, but the installation of new equipment (replacing older traditional technologies) and installation of longer lived technologies (replacing incandescent bulbs with compact fluorescent or LED bulbs) can reduce maintenance requirements. In the case of the Gateway combined heat and power project, ESF expects to realize approximately $450,000 in annual savings (after accounting for additional operations and maintenance support). In addition, ESF has tended to rely on available service contracts from vendors to minimize the impact on existing campus operations.

Despite a significant amount of funding available for new renewable/sustainable energy demonstration projects from Federal and New York State governments, there is relatively little funding available to maintain basic energy infrastructure and operating systems. In addition, funding for improved monitoring and controls in older existing buildings is a challenge to obtain. As a result, many of the building and monitoring systems in existing buildings remain outdated and inefficient.

ESF adopted significant non-energy related sustainable technology demonstration projects, and finding sufficient operational resources to support those has been challenging. This is largely because the bulk of the benefits that arise from those projects either occur off-site or the costs are external to ESF.

Although ESF has undertaken a number of initiatives to engage the campus community in sustainability demonstration projects, communication and coordination of ESF's sustainability efforts was the third most common theme of comments collected throughout the self study feedback process. As the College moves forward with its sustainability and campus master plan, the construction of the Gateway building and Academic Research Building (ARB) will provide additional research and teaching opportunities and on site demonstrations of sustainability practices for students.

Faculty, students and staff participate in campus sustainability projects at multiple levels and in a variety of ways. ESF's campus sustainability efforts are currently overseen by the Climate Change Commitment Committee. The Committee is a forum to discuss draft sustainability plans, sustainability research, demonstration projects, and serves as a mechanism to obtain input from a variety of campus constituencies. The committee is composed of President Murphy, the Director or Renewable Energy Systems, faculty members, and student leaders. The College's "Green Campus Initiative" (GCI), initially formed a decade ago as a faculty committee, has evolved into an active student organization, with involvement and now formal representation in various campus sustainability planning and implementation activities.

The Director of Renewable Energy Systems, who reports to the President, coordinates campus energy planning, and provides coordination for sustainability issues. A faculty member in Landscape Architecture was recruited by the President and teamed with the Director of Renewable Energy Systems to take the lead in sustainability planning related to the College's Master Plan/Sustainability Plan. The Web Developer in the Communications Office is staff advisor for the Green Campus Initiative, and through that, helps facilitate student input and involvement in campus sustainability planning and implementation efforts as well as web-based communication of these activities.

A variety of media is utilized in communicating the College's mission, strategic plan and associated sustainability planning efforts. The Internet is one key vehicle for such communication. The College's "sustainability" home page is frequented by online inquiries from both on and off campus; it is available at: http://www.esf.edu/sustainability/. Several times during the academic year, on campus discussions are held by President Murphy and others to communicate current planning efforts. In recent years, these have included presenting plans for the new Gateway Building, student residences, and the new academic/research building (ARB). These discussions have provided faculty, staff and students opportunities to learn about current campus sustainability efforts and offer feedback. The College has also installed signage at each physical sustainability initiative on campus grounds to inform visitors and ESF community members about their significance.

SUNY Chancellor, Dr. Nancy Zimpher, unveiled SUNY's strategic plan, The Power of SUNY, in 2011. ESF has played a lead role in the area of "SUNY and Energy Smart New York," and is well positioned to continue to evolve its sustainable demonstration projects in a manner consistent with the SUNY strategic plan.

ESF received capital project funding through the State University Construction Fund designated for sustainability and energy projects as recommended by the campus. The College has also been opportunistic in focusing on grants through the New York State Energy Research and Development Authority (NYSERDA), Department of Energy, Kaufman Foundation, National Grid, Anheuser Busch, and others to fund its sustainability efforts.

ESF has also been engaged with other community members to promote the region as an area with significant clean technology resources. The continued development of clean tech companies, funding sources and educational resources will improve the region's social, economic, and environmental standing.

Key Findings and Recommendations

ESF plans to continue to utilize State University Construction Fund capital funding, supplemented by grants from federal, state and local partners, to implement the bulk of the College's sustainability demonstration projects. The following includes key points and recommendations.

- Examine additional private/public partnerships as a way to finance sustainability projects and access potential fiscal benefits associated with renewable energy projects.
- Examine the development of a dedicated sustainability fund, based on a share of the economic savings realized from certain projects, to help develop a source of funds for environmentally beneficial demonstration projects.
- Engage in additional discussions with faculty to determine how to find more opportunities to link existing research interests and sustainability projects.

Study group members encouraged ESF to explore ways to bring focus to the sustainability efforts on campus to improve ESF's current practices of engaging internal and external constituencies. Specific recommendations included establishing a clearly designated Office of Sustainability, strengthening the coordination and communication of sustainability efforts to the college community, and integrating sustainability performance metrics throughout the institution.

- Establish sustainability performance metrics based on the STARS rating system for members of the President's Cabinet.
- Explore ways to improve communication of sustainability efforts to the college community including clarifying responsibility for all sustainability activities and an enhanced webpage.
- Consider clearly identify an Office of Sustainability.
- Engage the campus in a discussion of environmental stewardship and sustainability to determine the need to change the College mission and vision.

In addition, efforts must be made to enhance the College's sustainability communication efforts to internal and external audiences by enhancing the newsletters, publications and the website to provide more sustainability related content.

- Review the sustainability communications efforts to internal and external audiences to determine where students and faculty can enhance the effort.
- Establish performance metrics for the communication of sustainability efforts.
- Develop and publish a sustainability report.

ESF is well-positioned to align its campus master plan and sustainability plans with the new SUNY Strategic Plan regarding energy issues and demonstration projects.

- Review existing documents and develop future plans consistent with the new SUNY strategic plan.

Appendix 1. AASHE_STARS Sustainability Checklist Cross Referenced with Study Groups and MSCHE Standards

Category 1: Education & Research

Study Group 3: Education, Research and Outreach **Links with MSCHS Standards 10, 11, 12**

Co-Curricular Education

- Student Sustainability Educators Program
- Student Sustainability Outreach Campaign
- Sustainability in New Student Orientation*
- Sustainability Outreach and Publications
- Tier Two Co-Curricular Education Tier Two Credits

Curriculum

- Sustainability Course Identification
- Sustainability-Focused Courses
- Sustainability-Related Courses
- Sustainability Courses by Department*
- Sustainability Learning Outcomes*
- Undergraduate Program in Sustainability*
- Graduate Program in Sustainability*
- Sustainability Immersive Experience*
- Sustainability Literacy Assessment
- Incentives for Developing Sustainability Courses

Research

- Sustainability Research Identification*
- Faculty Involved in Sustainability Research*
- Departments Involved in Sustainability Research*
- Sustainability Research Incentives*
- Interdisciplinary Research in Tenure and Promotion*

Category 2: Operations

Study Group 1: Institutional Stewardship – **Links with MSCHE Standards 2, 3**

Buildings

- Building Operations and Maintenance (operations = resources)
- Building Design and Construction*
- Indoor Air Quality

Climate

- Greenhouse Gas Emissions Inventory
- Greenhouse Gas Emissions Reduction
- Tier Two Climate Tier Two Credits

Dining Services

- Food Purchasing*
- Tier Two Dining Services Tier Two Credits

Energy

- Building Energy Consumption
- Renewable Energy
- Tier Two Energy Tier Two Credits

Grounds
- Integrated Pest Management*
- Tier Two Grounds Tier Two Credits

Purchasing
- Computer Purchasing
- Cleaning Product Purchasing
- Office Paper Purchasing
- Vendor Code of Conduct
- Tier Two Purchasing Tier Two Credits

Transportation
- Campus Fleet
- Student Commute Modal Split*
- Employee Commute Modal Split
- Tier Two Transportation Tier Two Credits

Waste
- Waste Reduction
- Waste Diversion
- Construction and Demolition Waste Diversion*
- Electronic Waste Recycling Program
- Hazardous Waste Management
- Tier Two Waste Tier Two Credits

Water
- Water Consumption
- Stormwater Management
- Tier Two Water Tier Two Credits

Category 3: Planning, Admin & Engagement

Coordination and Planning links with Study Group 1; All other sections of Category 3 link with Study Group 2, details below

Coordination and Planning

Study Group 1: Institutional Stewardship - **Links with MSCHE Standard 1**
- Sustainability Coordination
- Strategic Plan*
- Physical Campus Plan*
- Sustainability Plan
- Climate Plan

Diversity and Affordability

Study Group 2 : Governance and Administration – **Links with MSCHE Standards 4, 5, 6, 8, 9**
- Diversity and Equity Coordination
- Measuring Campus Diversity Culture
- Support Programs for Under-Represented Groups
- Support Programs for Future Faculty
- Affordability and Access Programs
- Tier Two Diversity and Affordability Tier Two Credits

Human Resources
- Sustainable Compensation
- Employee Satisfaction Evaluation
- Staff Professional Development in Sustainability

Sustainability in New Employee Orientation
Employee Sustainability Educators Program
Tier Two Human Resources Tier Two Credits

Investment

Committee Socially Responsible Investment*
Shareholder Advocacy*
Positive Sustainability Investments*
Tier Two Investment Tier Two Credits

Public Engagement – Governance and Administration Study Group

Community Sustainability Partnerships
Inter-Campus Collaboration on Sustainability
Sustainability in Continuing Education*
Community Service Participation
Community Service Hours
Sustainability Policy Advocacy
Trademark Licensing *
Tier Two Public Engagement Tier Two Credits

* Credit does not apply to all institutions

Appendix 2. Additional Institutional Issues and Recommendations

Communication of Updates. Through the use of internet and email the community is kept up to date on a range of topics. We applaud the current efforts of the Provost's office on the regular electronic newsletter. Data from the campus wide survey which was administered showed that most faculty and staff feel somewhat (62%) or very well (31%) informed. The most important sources are department or staff meetings (73% for faculty, 59% for staff), emails (72% for faculty, 82% for staff), followed by casual conversations (65% for faculty, 59% for staff). Supervisors were important sources of information for staff (70%) and campus-wide meetings were more important to faculty (55%) than staff (36%).

Retention. ESF recently reinstated the College's Retention Committee, a standing committee that reports to the President of ESF. The group completed its report, and it is located on the faculty and staff website. The following are significant findings:

Although attrition is not a major concern currently at ESF, we are below our Vision 2020 plan of 80% retention. ESF is currently on target as compared to all SUNY doctoral-granting institutions (67% ESF, 65% SUNY). SF already has a well-developed set of SUNY-defined retention-related activities. These include:

- New/transfer student orientation
- First-year seminars (ESF 132)
- Supplemental instruction (tutoring)
- Placement testing for math
- Learning communities
- Intensive advising to help at-risk students (EOP)
- Peer/professional mentoring

Campus Calendars. We have multiple systems of calendars on campus which need to be combined and streamlined in an effort to better communicate the activities of the campus. For example, an online campus events calendar is aimed at students, a campus outreach calendar lists conferences, an academic calendar is hosted by the registrar, and computer lab calendars allow faculty and students to schedule labs. In addition, several departments host their own calendars. However, the main College calendar, located on the ESF website, does include campus-wide sustainability events.

Student Judicial Procedures. The Student Judicial Handbook clearly sets forth the student code of conduct and related policies and procedures. Student judicial procedures can play a significant role in the non-classroom development of the student population at ESF. As this population is mostly made up of young adults, issues of discipline and academic integrity will unfortunately arise. ESF's clear and concise set of policies is essential in order to maintain a sustainable process of not only educating students in their chosen subject matter, but also aiding in their development as effective members of society.

Academic Performance. A review of the ESF policy on academic performance extends equally to all students and indicates that students who earn less than a 2.000 cumulative grade point average are placed on academic probation for at least one semester. Students are suspended if they have been on academic probation for two successive semesters without achieving a 2.000 cumulative grade point average, or when their cumulative grade point average falls below the minimum values.

Readmit Process. ESF's Readmission process currently begins with the Office of Counseling and Disabilities Services. Information and requirements for readmission can be found on the OCDS web page for students: http://www.esf.edu/students/counseling/services.htm. When a student applies for readmission, s/he must complete the Application for Readmission and submit it the Sr. Counselor. The Sr. Counselor maintains any confidential medical information in cases where the student took a medical leave. If the leave was taken for other reasons, the request for readmission application is then reviewed by the Academic Team consisting of the Dean of Instruction and Graduate Studies as well as the student's Department Chair and Department members. Once all appropriate parties have reviewed the documentation, a decision is made by the Academic Team to either approve or deny the readmission. The Sr. Counselor has stated that this process works well, applies to all students and maintains student privacy.

Appendix 3. Centers and Institutes at ESF

Description of SUNY ESF Centers and Institutes

ESF, via its many Centers, Councils, and Institutes, promotes collaborative efforts among faculty members that foster sustainability 70 literacy and/or technological competency skills across the curricula. Of the 17 Centers, Councils, or Institutes surveyed, nine actively promote collaborative efforts across the curriculum toward one or more of ESF's sustainability goals.

The Adirondack Ecological Center (AEC; Dr. Douglas Allen, Interim Director) fosters cross-disciplinary collaboration in sustainability science among natural and social scientists. This occurs in many ways, including active collaboration on research projects within which students perform independent studies, workshops and courses. AEC is playing a lead role in a partnership between ESF and the Environmental Consortium of Hudson Valley Colleges and Universities called the "Source to Sink: Hudson River Watershed" whose purpose is to expand the existing network of information-sharing between science, education and humanities disciplines to address sustainability of the Hudson River. AEC hosts cross-disciplinary workshops research groups such as the "Humans Transforming the Hydrologic Cycle Summer Synthesis Institute," led by the City University of New York, a program for graduate students designed to generate integrative insights on the environmental and human dimensions on the hydrologic system in the Northeast United States. AEC is also the site for forest ecology and management courses and workshops (typically involving the EFB and FNRM departments among others). The AEC also hosts cross-disciplinary and team-taught courses such as "Adirondack Forest Ecology and Management" and "Adirondack Park: Science and Policy of Conservation" (taught jointly with University of Vermont). The Adirondack region's long history of implementing policies for use and protection of natural resources and maintaining viable human communities in a largely natural setting makes it ideal for exploring issues of sustainability.

The American Chestnut Research and Restoration Center enhances sustainability principles 1 and 3 while trying to actually overcome a "limitation of nature's capacity" that fits in principle 2. From early on, the Chestnut Center has involved close collaboration among faculty members and students in both EFB and FNRM. The collaboration has extended to include Dr. Scott Merkle at the University of Georgia, ArborGen LLC. (one of two major players in the forest biotechnology industry), and more than 20 years of collaboration with The New York State chapter of The American Chestnut Foundation. A recent collaboration with the Forest health Initiative has expanded collaborations to include researchers at Penn State Univ., University of GA, Clemson Univ., SC, NC State, Oak Ridge National Labs, Conn. Exp. Station, and the U.S. Forest Service. We have hosted visiting scientists from China, Germany, and Portugal, and graduate students from all over the world. The stated mission of the American Chestnut Research and Restoration Center is nothing less audacious than to rescue a major tree species from extinction. Without human intervention, the American chestnut is slowly but steadily spiraling toward extinction. The ultimate goal is to release a modestly diverse population of resistant trees and planting them intermixed with remnant native populations. We hope that 71 mating will occur with the remnant population, and that the resulting progeny will spread the resistance genes into more native populations, throughout the species range.

Center for Community Design Research supports faculty, staff and students working with rural and urban communities to help protect environmental and cultural resources, manage growth and initiate revitalization efforts. These participatory projects have primarily involved Landscape Architecture students as well as graduate students in Environmental Studies. The CCDR recognizes the value and need to collaborate with other disciplines within the College to address the complex issues facing contemporary society and intends to pursue those opportunities with future projects. A current project to prepare a master plan and management plan for the Zenda Farm Preserve in Clayton, NY, will engage the expertise of the Thousand Islands Biological Center.

The Empire State Paper Research Institute enhances collaboration in principles 2 and 3. Studies funded in part by ESPRI investigate the ability of natural products, especially woody biomass, to be carefully disassembled to meet the needs of society. This work includes cooperative efforts with colleagues in the Forest and Natural Resources Management (FNRM) Department (example biomass willow capacity and utility as a

biomass feedstock), with the Department of Environmental Forest Biology (EFB) (e.g., how nonfood sugars from wood can be converted to products needed by society) and with the Chemistry Department (e.g., how to engineer microorganisms to utilize non-glucose sugars). Studies supported in part by ESPRI focus on development of sustainable and economically viable ways to produce renewable fuels, chemicals, energy, and polymers from woody biomass. These studies have involved faculty and students from FNRM, Chemistry, EFB, Environmental Resources Engineering (ERE), Construction Management and Wood Products Engineering (CMWPE), and Landscape Architecture (LA).. The projects have ranged from quantification of the transportation challenges for woody biomass, to willow utilization, to development of novel fermentation systems and novel chemical analytical systems. These projects have been a component of both MS and PhD degrees as well as contributing to courses in the undergraduate and graduate curricula.

Council on Hydrologic Systems Science actively promotes collaboration across the curriculum via its "Cross-disciplinary Seminar in Hydrological and Biogeochemical Processes" that first met in the Spring Semester of 2008, and has continued to meet through Spring, 2011. More than 200 faculty members and graduate students from nine departments at ESF and Syracuse University have participated in this seminar in which speakers from a wide variety of disciplines and agencies offer a large range of presentations and other forms of seminar activities including demonstrations and discussions, and focus on all three sustainability areas listed above, 72 particularly focused on water resources. This venture has allowed individuals from different disciplines to interact both formally as well as casually.

The Herman L. and Gertrude Joachim Endowment Fund was established through a bequest of Dr. Joachim and is administered by the Syracuse Pulp and Paper Foundation. The goal of Dr. Joachim was "to enhance the abilities of Paper Science and Engineering students to become better managers. In his words, the focus should be 'Management Basics.'" To the extent that these students need to understand sustainability in their management endeavors, the Walker fund does indeed foster sustainability literacy and technical competency. The Joachim fund has been used collaboratively with other departments. For example, one of the Joachim fellows was the teaching assistant for a course in forest and natural resource management last year. Students from other schools and majors will be allowed to participate in programs supported by the Fund on a space available basis.

The mission of the **ESF Center for Native Peoples and the Environment** is to create programs that draw on the wisdom of both indigenous and scientific knowledge in support of our shared goals of environmental sustainability. Center programs include efforts in education, research and public outreach. The Center sponsored an interdisciplinary conference titled "Conversations on the Land: Indigenous and Scientific Principles for Sustainable Communities" attended by more than 200 participants. The Center offers courses which span the ESF curriculum, including "Indigenous Issues and the Environment" and "Onondaga Land Rights and Our Common Future." The Center routinely collaborates with tribal nations on issues of environmental sustainability.

The Randolph G. Pack Environmental Institute supports and encourages the research and public service activities in the broad area of international environmental, natural resources, and conservation policy. The Pack Institute was established at ESF in November 1995, with a generous gift by Virginia Pack Townsend, in honor of her father, Randolph Greene Pack, philanthropist and international forestry policy expert. The purpose of the Randolph G. Pack Environmental Institute is to enhance the ability of the Department of Environmental Studies to create and disseminate knowledge about environmental concerns of high public interest. Reflecting and strengthening our graduate program themes, the Institute seeks to advance scholarly and popular knowledge of key contemporary issues related to environmental policy and regulation. It focuses on how democratic public decisions affecting the natural environment are made, concentrating on topics such as public participation, environmental equity, and sustainable development. The Institute promotes these interests through encouraging research and service activities in community, state, national, and international venues. A key feature has been the large number of faculty participating in activities of the 73 Institute, including scholars from across ESF, Syracuse University, elsewhere in New York state, the USA, and internationally.

The Salix Consortium promotes cooperation and collaborative efforts in research and outreach projects with short-rotation woody crops, especially willow energy crops, among graduate and undergraduate students,

faculty members and Departments at SUNY-ESF (FNRM, EFB, ERE, PBE, LA and Outreach), other Universities (namely Cornell, Univ. of Toronto, Univ. of Minnesota, Michigan State, and SUNY- Delphi), NY State Agencies (NYSERDA, NYSDOT and DEC – Saratoga Nursery), Federal Agencies (DOE and USDA), private industry (Case New Holland, Double A Willow, Honeywell, state utilities (Niagara Mohawk (National Grid) and NYSEG), and internationally (Sweden, UK, New Zealand, China, Chile, and Ontario and Quebec in Canada) that foster sustainability literacy and technological competency. The areas covered include: (1) understanding basic functions of natural and social systems; (2) acknowledging and quantifying the limitations of nature's capacity; and (3) developing solutions through the integration of social, economic, technological, and environmental systems.

ESF Center for the Urban Environment was initiated by the College with the explicit purpose of fostering interdisciplinary research, teaching and community outreach that would address making our increasingly urbanized world sustainable vis-à-vis the environmental systems that support life and quality of life in urban areas. Participants in the Center, and in joint research fostered by the center's initiatives, come from all departments across campus, as do students in the urban environmental science minor, which is led by CUE faculty members.

The State University of New York (SUNY) Center for Brownfield Studies (CBS) is an educational initiative focused on environmental management and the redevelopment of brownfield properties. Brownfields are abandoned, idled, or under-used properties where expansion or redevelopment is complicated by real or perceived environmental contamination. The CBS focuses on urban, economic and environmental remediation and redevelopment in both metropolitan and rural settings as diverse as urban centers, such as New York City, and small rural hamlets, such as Remsen, New York. The Center focuses on three major areas:

1. Academic programs to deliver a holistic curriculum that encompasses skills related to remediation and redevelopment.
2. Community support programs to become the "go to" place for training and advice on State and Federal programs for regulation and funding, and technical assistance on remediation, and economic development.
3. Research and development of innovative processes and technologies for cost-effective, implementable, and protective solutions to protect public health and environment at brownfield sites.

The Center provides undergraduate and graduate students with varied expertise, disciplines, and skills necessary for returning negatively impacted properties to productive use. Both public and private sectors will teach and learn at the Center and contribute to the research that will ultimately enhance society's ability to evaluate, remediate, and redevelop brownfields. As a multidisciplinary agent, the Center approaches projects with a perspective on community design and planning, environmental and ecological mitigation and restoration, community economic development, business development, energy systems, transportation systems, urban ecology and landscape restoration, urban forestry, and cultural preservation and conservation.

Appendix 4. ESF Rankings & Ratings

ESF among America's Best Colleges

ESF has, for the tenth year in a row, earned a place among the top universities in America, as ranked by U.S. News & World Report.

In the "Great Schools, Great Prices" category of the 2011 edition of America's Best Colleges, ESF ranked 25th. The formula used in that category relates a school's academic quality to the net cost of attendance for a student who receives the average level of need-based financial aid. ESF is the only SUNY institution listed in this category.

ESF is listed at 34 among the top public national universities and at 79 in the list of best national universities, which includes both public and private institutions. ESF is the highest-ranked SUNY college in both categories. ESF was also listed among 84 universities in a category called, "A-Plus Schools for B-Plus Students" that recognizes outstanding colleges that admit part of their entering class from among B-plus average students with special qualities and academic interests. ESF, with academic programs focused solely on the environment, considers students' interest in environmental matters, in addition to grades and test scores, as a factor in the admissions process.

In the spring of 2007, U.S. News picked SUNY-ESF as one of four outstanding science-oriented colleges in the Northeast that the magazine would feature in a special video for prospective students. The other featured schools were MIT, RPI and Clarkson University. View the U.S. News "Science in the Northeast" video to see why SUNY-ESF was ranked among these top schools.

Forbes.com Ranks SUNY-ESF #23 Among America's Best College Buys

Forbes Magazine has published a new set of college rankings on its Forbes.com website, placing the SUNY College of Environmental Science and Forestry (ESF) at #23 in its listing of "America's Best College Buys" for 2010.

The Forbes.com rankings focus on the investment that students and families make in a college education, and the value they receive in return. Forbes asked the Center for College Affordability and Productivity, a Washington-based think tank, to compile their rankings based on five heavily-weighted factors:

1. Student satisfaction (weighted 27.5 percent) based upon student evaluations from RateMyProfessors.com, freshman-to-sophomore retention rates and student evaluations from MyPlan.com.
2. Postgraduate success (weighted 30 percent) based upon salary of alumni from Payscale.com, listings of alumni in Who's who in America and alumni listed in Forbes/CCAP Corporate Officers List.
3. Student debt (weighted 17.5 percent) based upon four-year debt load for a typical student borrower and student loan default rates.
4. Four-year graduation rate (weighted 17.5 percent) based upon actual four-year graduation rate and predicted vs. actual four-year graduation rate.
5. Competitive student awards (weighted 7.5 percent) based upon National Science Foundation scholarships, Truman Scholarships, Rhodes Scholarships, Goldwater Scholarships, etc.

These five criteria have not been commonly used in other college rankings, which most often depend upon data that are self-reported by college officials. Forbes wanted to develop a ranking system that used other available sources to assess student and faculty achievement, alumni success, student reaction to their professors, debt burdens, and the likelihood of graduating on time. Their methodology is unique, and sure to raise a few eyebrows on campuses across the nation.

Forbes.com Ranks ESF #3 for Women in STEM Fields!

Forbes.com has also ranked SUNY-ESF at #3 on its 2010 list of the 20 best colleges for women in science, technology, engineering and mathematics (STEM). According to Forbes, "these are the schools that are getting it right" by helping significant numbers of women graduate with college degrees in these important and

higher-salaried career areas. SUNY-ESF is one of only two state-funded public colleges on this list, which includes Cal Tech, MIT, and several other schools known for excellence in science and engineering research and teaching.

Washington Monthly: ESF Is No. 26 for Service

The Washington Monthly College Guide has ranked ESF No. 26 among the nation's top service-oriented colleges and universities.

Washington Monthly says it set out to devise a different way of ranking colleges: one based on the amount of service colleges provide to society. The magazine said it "devised a way to measure and quantify how well individual colleges and universities were meeting their public obligations in the areas of research, service and social mobility and we ranked schools based on the results." Washington Monthly defines research as "producing cutting-edge scholarship and Ph.D.s," while service is defined as "encouraging students to give something back to their country," and social mobility means "recruiting and graduating low-income students."

ESF Named to President's Service Honor Roll

In recognition of its exemplary student community service and service-learning programs, ESF has been named to the President's Higher Education Community Service Honor Roll for 2010.

This recognition comes to the college from the federal government for ESF's commitment to volunteering, service learning and civic engagement.

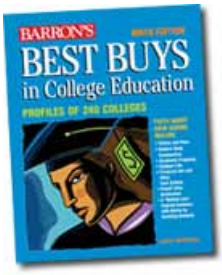
This is the third year ESF has been recognized through the Honor Roll. The College is listed among a select group of more than 600 universities honored across the nation.

The nominating committee for this award evaluates the scope, innovativeness and effectiveness of a college's community service and service learning programs to select the honored institutions. ESF students completed close to 71,000 hours of community service in 2009-2010. Their service projects included a Freshman Saturday of Service, Adopt-A-Stream cleanup, the ESF SCIENCE Corps, a Campus Day of Service and Hurricane Katrina relief efforts.

Another important selection component is how students and faculty interact with their community and how service is incorporated into the college's learning objectives. ESF faculty members play an important role in connecting students to service opportunities through service learning projects that connect classroom lessons with hands-on activities in the Syracuse area and beyond.

The President's Honor Roll, launched in 2006, recognizes colleges and universities nationwide that support innovative and effective community service and service-learning programs. It is a program of the Corporation for National and Community Service and is sponsored by the President's Council on Service and Civic Participation, the U.S. Department of Education and the U.S. Department of Housing and Urban Development, in partnership with Campus Compact and the American Council on Education.

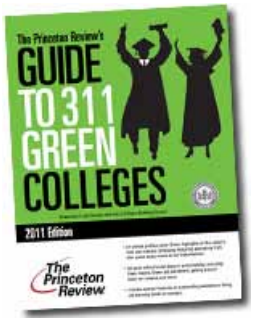
College gets "Best Buy" designation from Barron's



ESF is listed in the ninth edition of Barron's Best Buys in College Education. ESF is one of 247 colleges and universities listed, and one of only five SUNY institutions in the book.

"For students who not only love the environment but are committed to learning how to preserve it through highly specialized and challenging curricula with plenty of hands-on experience, the answer may be SUNY-ESF,"the book states.

Barron's surveys current students and asks them about the quality of each college and not just the cost. As a part of the State University system, ESF is affordable, but also strong academically, and that is what provides the real value to students and their families.



College earns spot in Guide to Green Colleges from Princeton Review

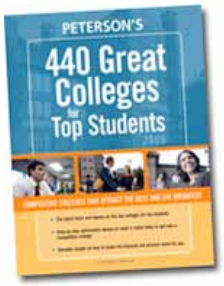
- Download The Princeton Review's Guide to 311 Green Colleges (PDF, large file)

The SUNY College of Environmental Science and Forestry (ESF) is listed in the Princeton Review Guide to 311 Green Colleges. The Princeton Review partnered with the U.S. Green Building Council to identify the schools with the nation's most eco-friendly campuses and present information about each school's sustainability, "green" majors and "green" job placement.

"Going green isn't a campaign at the State University of New York College of Environmental Science and Forestry — it's a modus operandi," the book states. "With sustainability and environmental education at the core of the university's mission, SUNY-ESF has been at the forefront of nationally recognized, government-supported research in green issues."

The publication cites ESF's involvement with the development of an ethanol-producing biorefinery in New York and notes the college is committed to being carbon neutral by 2015.

In preparing the book, the Princeton Review surveyed 2,000 colleges and universities. The introduction describes the selected schools as demonstrating "a strong commitment to sustainability." It says the survey was both qualitative and quantitative, investigating whether students have a healthy and sustainable campus quality of life; how well a school is preparing students for careers in the "green" economy; and the environmental responsibility of a school's policies..



ESF Included in Peterson's Guide for Top Students

ESF was named one of the top 440 colleges by Peterson's in its 440 colleges for Top Students guide. Colleges were selected based on the school's competitiveness in the admissions environment. This was measured over a meaningful period of time by entering class statistics, such as GPA, class rank, and test scores. The colleges selected for inclusion routinely attract and admit an above-average share of the nation's top-achieving students.

ESF Receives STARS Silver Rating for Sustainability Achievements

- ESF Receives STARS Silver Rating for Sustainability Achievements

The SUNY College of Environmental Science and Forestry (ESF) has received a STARS Silver Rating in recognition of its sustainability achievements from the Association for the Advancement of Sustainability in Higher Education (AASHE).

"We are proud of the progress the College has made in all areas of sustainability, but we are most proud of the fact that it is our students who are the creative and passionate force behind so many of our successes," said ESF President Cornelius B. Murphy, Jr. "ESF has committed to carbon neutrality by 2015; the STARS program is an integral part of that effort."

ESF's plan to eliminate its carbon footprint by 2015 uses a combination of energy conservation, alternative energy projects, new construction that focuses on energy-efficient design and innovative heat-and-power systems, action to engage the College community in reducing waste, and forest carbon sequestration centering on design and management of ESF's forested properties.

Sierra Club Says ESF is Cool

- Cool Schools - Sierra Club

ESF has earned a place on the 2010 Sierra Club list of "Cool Schools," earning a rating that places the College at No. 45.

The list was compiled after the Sierra Club surveyed hundreds of colleges and universities to gather information about campus environmental practices, green initiatives, and quality of sustainability-oriented education. The survey looked specifically at energy efficiency and supply sources, food sources, academic programs and research, purchasing, transportation, waste management, and administration.

ESF received a perfect mark of 10 for academics based on the College's broad range of environmentally related degree programs. ESF also scored a 10 on the administration rating, which reflects the College's

institutional commitment to campus sustainability; a 10 for its investment practices; and a 10 for its involvement in green initiatives that did not fall into any other category.

ESF is the highest-rated State University of New York campus on the Sierra Club list.

Department of Landscape Architecture achieves national ranking

- Design Intelligence website

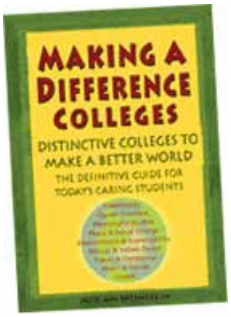
ESF's Department of Landscape Architecture has, for the second year in a row, been ranked among the nation's top programs in that discipline. In rankings compiled by DesignIntelligence magazine, the undergraduate program at ESF was ranked 12th in the United States. The graduate program was ranked ninth.

When the survey results were broken down by region, the ESF undergraduate program did even better, with employers ranking the College second in the East, in a tie with Cornell University. The study ranks programs accredited by the Landscape Architecture Review Board, based on a survey of leading landscape architecture firms and public practitioners.

Kaplan calls ESF a "Cutting-Edge School"

ESF is listed among 25 "Cutting-Edge Schools" in the 2008 edition of "You Are Here," a college guide produced by Kaplan Publishing. The cutting-edge schools are tied to what the book describes as "50 of today's hottest careers." Those careers include several ESF specialties: chemistry, environmental engineering, environmental science and hydrology, and landscape architecture.

According to Kaplan, "The typical ESF student is — no surprise here—outdoorsy and committed to environmental responsibility." "ESF students forego football in favor of their nationally ranked Woodsmen's Team — we said it's outdoorsy — and soccer, golf and hockey clubs." Kaplan produces more than 150 titles annually on topics such as test preparation, college and graduate school admissions, and finance and investing.



Making a Difference Colleges guide—ESF is "...a leader in the discovery of new knowledge and tools to deal with environmental challenges."

SUNY-ESF has been included as one of 71 distinctive colleges chosen for the 2007 edition of the Making a Difference Colleges guide. Published as "the definitive guide for today's caring students," the tenth edition of this publication features colleges that actively support social and environmental responsibility. SUNY-ESF was selected based upon the college's strong environmental focus, as well as its variety of service learning and field study options, interdisciplinary programs, and other factors.

According to the guide, "Students at ESF share an interest in the environment and in the science, design and engineering required to conserve resources and to improve their world. The college is a leader in the discovery of new knowledge and tools to deal with environmental challenges, and the latest faculty research is aimed at bioprocessing willow trees to produce ethanol. ... Student involvement with societal issues is enhanced through a very active community service program and more than 60 service learning courses. Each program features internships, field study, research projects or cooperative education to provide students with career-related experience."

SUNY-ESF Named a "Best in the Northeast" College by the Princeton Review

SUNY-ESF is one of the best colleges and universities in the Northeast according to The Princeton Review. The New York City-based education services company selected the school as one of 218 institutions it recommends in its "Best in the Northeast" section on its PrincetonReview.com feature 2011 Best Colleges Region by Region.

Robert Franek, Princeton Review's V.P., Publishing, says "We're pleased to recommend ESF to readers of our book and users of our site as one of the best schools to earn their undergrad degree. We chose it and the other terrific institutions we name as 'regional best' colleges mainly for their excellent academic programs. From several hundred schools in each region, we winnowed our list based on institutional data we collected directly from the schools, our visits to schools over the years, and the opinions of our staff, plus college counselors and advisors whose recommendations we invite. We also take into account what students at the schools reported to us about their campus experiences at them on our 80-question student survey for this project."

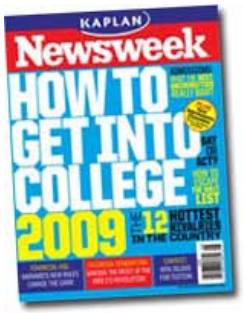
The 218 colleges The Princeton Review chose for its "Best in the Northeast" website are located in 11 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont and the District of Columbia. The Princeton Review also designated 152 colleges in the Midwest, 120 in the West, and 133 in the Southeast as "regional best" colleges in their locales. The 623 colleges named "regional best(s)" represent about 25% (one out of four) of the nation's 2,500 four-year colleges.

ESF Featured in Service-Learning Guide

A service-learning project completed by the Department of Landscape Architecture was highlighted in the Guide to Service-Learning Colleges & Universities. Landscape architecture students put classroom learning to work to design a public garden space that tells the story of Vietnamese immigrants living in a local Syracuse neighborhood.

The landscape architecture program is one example of the College's overall service-learning program in which community service is integrated into course curriculum. ESF students consistently contribute approximately 65,000 hours of community service to the area each year.

The Guide to Service-Learning Colleges and Universities is a unique college guide that provides a one-stop resource for the college-bound community to research schools that excel in offering experiential learning opportunities. It also offers community service information to high school counselors and administrators of America's community-based organizations.



ESF One of 350 "Most Interesting" Colleges

ESF was named one of the nation's 350 most interesting colleges in the 2009 edition of "How to Get into College" produced by Kaplan/Newsweek. ESF was also listed as one of four top schools for environmental science majors, along with Yale University, Barnard College and Rutgers University.

The 2009 Kaplan/Newsweek guidebook helps college-bound students navigate the increasingly complex college admissions landscape. From guidance on the admissions process to insights on school trends, the "How to Get into College" Guide is designed to help students and their families by illuminating the issues, challenges and opportunities that await them starting with the college application process and continuing through their college senior year.

National Wildlife Federation Gives ESF High Marks for Environmental Action

- NWF Campus Report Card 2008

ESF received high marks for environmental action in Campus Environment 2008: A National Report Card on Sustainability and Higher Education, issued by the National Wildlife Federation.

ESF was among the colleges and universities described as "exemplary and committed" in the category, "Exemplary Schools for Students Taking a Course on Ecology or Sustainability." The College was also listed as exemplary in the category that examined "Environmental or Sustainability Goal Setting."

ESF Innovation Recognized in Better World Report

ESF is listed in The 2008 AUTM Better World Report Part Two, which highlights colleges that have successfully transferred academic research into real-world applications. The report is published by the Association of University Technology Managers.

ESF is listed twice among the 100 innovators in the report and is one of only two SUNY schools included. The report includes colleges from the United States and around the world. The College received recognition for its willow biomass research and for improvements in forest biorefinery technology.

ESF scientists have developed fast-growing varieties of shrub willow that can be harvested and burned as a substitute for coal or natural gas. The ESF-developed willow display improved disease and pest resistance, higher yield of biomass, and are suitable for large-scale commercialization. Commercialization of this process

is being led by the Research Foundation of State University of New York.

Forest biorefinery is the full conversion of wood biomass into fibers, chemical and energy. ESF developed new processes to make it easier to take advantage of the co-products produced by pulp mills.

For decades pulp mills burned or discarded wood sugars and hemicellulose, which can be used in the manufacturing of plastics, ethanol and acetic acid. New processes developed at ESF make it easier to take advantage of these co-products thereby maximizing the value of a renewable resource.

"These 100 innovations illustrate the many ways in which collaboration among many talented individuals leads to the success of academic technology transfer," the report states.

Treehugger.com Ranks ESF among Nation's Top 10 Environmental Programs

SUNY-ESF is listed among the 10 best college environmental programs in the nation by Treehugger.com, a website devoted to sustainability and environmental news.

Treehugger states the colleges on the list "earn an A-plus for the education, experience, and research opportunities they provide."

ESF, which is second in Treehugger's list, is highlighted for its extensive network of field stations. Treehugger describes the College's forested lands as "more than 25,000 acres of land in Central New York and the Adirondack Park, where nearly 2,500 students in the graduate and undergraduate programs choose majors as specific as aquatic and fisheries science, construction management, forest ecosystem science, paper engineering, and bioprocess engineering."

The College's research projects also earn praise. Treehugger notes that faculty members work on more than 450 projects - including wildlife disease prevention, nanotechnology and genetic engineering - around the world.

ESF earns strong Faculty Scholarly Productivity Index ranking

ESF has been ranked among the nation's top colleges and universities for scholarly work.

The ranking system, called the Faculty Scholarly Productivity Index, lists ESF fifth among colleges and universities in the category of "Specialized Research Universities—Applied Sciences." ESF is also ranked eighth in the subcategory of "Fisheries Science and Management." The scholarly productivity index is produced by Academic Analytics, a for-profit company.

The index rates faculty members' scholarly output at nearly 7,300 doctoral programs around the country. It examines the number of books and journal articles published by each program's faculty, as well as journal citations, awards, honors, and grants received.

Appendix 5. Research Data

Top 5 Sponsored Program Project Expenditures: 2010-11 FYTD June 30

Award Sponsor	Award Type	Project PI	Direct Cost Actual Expenditures	Indirect Cost Actual Expenditures	Total Actual Expenditures	Award Number	Project Number
US Department of Energy	Federal	Amidon, Dr. Thomas E	239,323.72	123,340.04	362,663.76	54165	1087714
National Fish and Wildlife Foundation	Nonfederal	Farrell, Dr. John M	205,650.58	63,751.69	269,402.27	50813	1080067
National Science Foundation	Federal	Globs, Dr. James	232,129.66	20,204.00	252,333.66	46628	1071321
US Department of Energy	Federal	Volk, Dr. Timothy A	194,066.98	29,108.15	223,175.13	56055	1091679
USDA Animal and Plant Health Inspection Service	Federal	Teale, Dr. Stephen A	192,237.82	19,223.78	211,461.60	54756	1088741

Top 5 Sponsored Program New Awards and Funding Changes to Existing Awards: 2010-11 FYTD June 30

Award Sponsor	Award PI	Award Start Date Active	Award End Date Active	Direct Volume	Indirect Volume	Total Volume	Award Number
National Science Foundation	Ringler, Dr. Neil H	10/1/2010	9/30/2013	1,470,000.00	0.00	1,470,000.00	55670 [AA]
NYS Energy Research and Development Authority	Driscoll, Dr. Mark S	1/26/2011	7/25/2012	806,905.00	108,261.00	915,166.00	57392
US Department of Energy	Volk, Dr. Timothy A	9/1/2009	8/31/2011	618,900.00	111,510.00	730,410.00	56055
USDA Cooperative State Research Service	Ringler, Dr. Neil H	10/1/2010	9/30/2011	584,532.00	0.00	584,532.00	55493
Honeywell International Incorporated	Volk, Dr. Timothy A	5/1/2011	4/30/2012	303,359.00	178,982.00	482,341.00	58088

** Designation represents supplemental funding of existing award, no designation represents a new award

[AA] Designation represents funding received under ARRA-funded program

Top 5 Proposal Submissions: 2010-11 FYTD June 30

Sponsor Name	Proposal PI	Requested Start Date	Requested End Date	Direct Cost Request	Indirect Cost Request	Total Request	ORP Preaward ID
Pennsylvania State University	Volk, Timothy	4/1/2011	3/31/2016	8,262,700.00	2,330,498.00	10,593,198.00	5679
US Department of Energy	Amidon, Thomas E.	8/1/2011	7/31/2014	5,492,636.00	2,324,008.00	7,816,644.00	5795
US Department of Commerce	Fleschko, John	1/1/2012	12/31/2012	5,715,206.00	0.00	5,715,206.00	5858
National Science Foundation	Kimmerer, Robin W.	3/1/2012	2/28/2017	3,200,020.00	299,980.00	3,500,000.00	5934
National Science Foundation	Kimmerer, Robin W.	3/1/2011	2/29/2016	2,994,669.00	205,331.00	3,200,000.00	5511

Green Highlighting represents Top 5 changes during the past month

2009 American Recovery and Reinvestment Act (ARRA) - "Economic Stimulus" Activity: February 2009 through June 30, 2011

	Number	Direct	Indirect	Total	IC:DC Ratio	Number Still Pending	Amount Pending
ESF Proposal Submissions	23	22,945,689	3,298,620	26,244,309	14.38%	0	0
SUNY-wide Proposals Submitted	678	N/A	N/A	403,000,000	N/A	(as of 5/31/09)	
ESF ARRA Awards	3	1,649,740	91,065	1,740,805	5.52%		
SUNY-wide Awards Received	372	N/A	N/A	153,076,753	N/A	(as of 5/31/11)	
Expenditures	2	153,159	71,653	224,812	46.78%		

SUNY ESF | Office of Research Programs | 7/8/2011

Cabinet Update
Research Foundation Activity
2010-11 Fiscal Year-to-Date as of June 30, 2011

Sponsored Program Expenditures: 2010-11 FYTD June 30

	FYTD Direct	Change	FYTD Indirect	Change	FYTD Total	Change	Per Capita*
SUNY Doctoral Degree Granting Institutions:	697,810,164	9%	132,684,045	3%	830,494,209	8%	157,626.52
University at Albany	311,555,059	27%	25,855,917	-3%	337,410,975	24%	514,346.00
Binghamton University	30,782,772	4%	7,862,760	6%	38,645,532	5%	66,630.23
University at Buffalo	116,276,110	2%	35,685,928	1%	151,962,038	2%	97,536.61
Stony Brook University	144,329,534	-11%	39,641,205	4%	183,970,738	-8%	126,527.33
SUNY Downstate Medical Center	50,100,179	12%	10,485,658	20%	60,585,838	13%	137,382.95
Upstate Medical University	30,914,394	6%	10,017,197	6%	40,931,591	7%	104,952.00
SUNY ESF	11,158,721	-10%	2,197,322	0%	13,356,043	-9%	108,585.71
College of Optometry	2,693,395	13%	938,058	5%	3,631,454	10%	60,524.23

SUNY ESF	FYTD Direct	FYTD Indirect	FYTD Total	IC:DC Ratio
2010-11 FYTD June 30	11,158,721	2,197,322	13,356,043	19.69%
2009-10 FYTD June 30	12,399,271	2,203,461	14,602,732	17.77%
Change	-10%	0%	-9%	10.81%

* Per Capita calculations based on SUNY Full-Time Faculty IPEDS Headcounts as of 2008

Sponsored Program New Awards and Funding Changes to Existing Awards: 2010-11 FYTD June 30

	FYTD Direct	Change	FYTD Indirect	Change	FYTD Total	Change	Per Capita *
SUNY Doctoral Degree Granting Institutions:	761,814,350	13%	131,037,417	-11%	892,851,767	8%	169,679.17
University at Albany	405,476,314.63	52%	26,548,213.43	-19%	432,024,528.06	44%	658,573.98
Binghamton University	27,680,228.59	-22%	7,240,733.02	-18%	34,920,961.61	-21%	60,208.55
University at Buffalo	111,270,348.93	-7%	36,112,790.04	-4%	147,383,138.97	-6%	94,597.65
Stony Brook University	125,208,123.40	-22%	39,311,647.39	-12%	164,519,770.79	-20%	113,149.77
SUNY Downstate Medical Center	49,373,303.16	4%	10,268,568.65	-2%	59,641,871.81	3%	135,242.34
Upstate Medical University	27,952,647.30	-18%	8,650,537.51	-17%	36,603,184.81	-18%	93,854.32
SUNY ESF	12,997,190.45	34%	2,122,159.12	-3%	15,119,349.57	27%	122,921.54
College of Optometry	1,856,193.84	-33%	782,767.86	-30%	2,638,961.70	-32%	43,982.70

SUNY ESF	FYTD Direct	FYTD Indirect	FYTD Total	IC:DC Ratio
2010-11 FYTD June 30	12,997,190	2,122,159	15,119,350	16.33%
2009-10 FYTD June 30	9,733,835	2,185,406	11,919,241	22.45%
Change	34%	-3%	27%	-27.26%

* Per Capita calculations based on SUNY Full-Time Faculty IPEDS Headcounts as of 2008

Proposal Submissions: 2010-11 FYTD June 30

					Major Proposal Adjusted Base Volume		
	FYTD Number	FYTD Amount	Average Amount	IC:DC Ratio	Adjustment Amount	FYTD Amount	Average Amount
2010-11 FYTD June 30	242	74,959,551	309,750	25.13%	30,825,048	44,134,503	186,222
2009-10 FYTD June 30	274	79,176,404	288,965	18.06%	25,046,183	54,130,221	201,978
Change	-12%	-5%	7%	39.22%	23%	-18%	-8%

Proportion of New Award Value : Proposal Value (One Dollar Awarded per Dollars Proposed)

					Major Proposal Adjusted		
2010-11 FYTD June 30	15,119,350 / 74,959,551	=	1 / 4.96		15,119,350 / 44,134,503	=	1 / 2.92
2009-10 FYTD June 30	11,919,241 / 79,176,404	=	1 / 6.64		11,919,241 / 54,130,221	=	1 / 4.54

Analysis:

Total Sponsored Expenditure volume has finished the fiscal year with an overall 9% decline relative to FY2009-10, due to a 10% decrease in Direct expenses. Indirect Cost Expenditure revenue finished the year with no growth relative to last fiscal year, but resulting in a 19.69% IC:DC Ratio against the significantly declining Direct Cost Expense base. Indirect Expenditure volumes fell well below our revenue target established in the RF financial plan for FY2010-11, with a revenue shortfall of approximately $125K.

Total New Award Funding finished the year with a significant growth rate of 27% over FY2009-10, driven by a 34% growth of new Direct Cost funding. New Award Indirect Funding finished FY2010-11 with a 3% decrease relative to last fiscal year. As a result of increasing Direct Cost volume and decreasing Indirect Cost volume, the IC:DC ratio finished the year at 16.33%, versus 22.45% at the same time last fiscal year. This diminishing return is a significant risk to the sustainability of the operational budget funded from RF overhead income, relative to recent budget funding levels.

The number of Base Proposal Submissions finished FY2010-11 with a decline of 12%, and base Proposal dollar volume fell by 18% relative to the last fiscal year. Meanwhile budgeted Indirect Cost recovery for Base Proposals fell only 1% against the 17% decline in Direct Cost submission value, providing an increase in the IC:DC Ratio from 22.7% in FY2009-10 to 26.9% this year. The Proportion of New Award Value to Base Proposal Value metric is also very strong at nearly 34% versus roughly 22% for FY2009-10.

At $108,586 ESF improves to rank #4 in Per Capita Expenditures among the SUNY doctoral campuses, moving ahead of UMU in June. ESF also maintains rank #3 behind SUNY Albany and Downstate Medical in Per Capita New Award Funding at $122,922. ARRA metrics other than Expenditures are now relatively static - the federal agencies were required to issue all remaining ARRA awards prior to 10/1/10. To-date ARRA awards have had a negligible impact on ESF's expenditure volumes, however that trend will shift to provide a modest increase in expenditures as the NSF Fisheries Infrastructure grant comes fully online.

SUNY ESF | Office of Research Programs | 7/6/2011

Research Foundation Expenditures
Fiscal Year 2010-11
Expenditure Activity by Sponsor

FEDERAL	Direct Volume	% Total Direct	% Change FY0910	Indirect Volume	% Total Indirect	% Change FY0910	Total Volume	% Total	% Change FY0910	IC/DC Ratio FY1011	IC/DC Ratio FY0910
National Aeronautics and Space Administratior	224,374.16	2.0%	4%	94,782.64	4.3%	8%	319,156.80	2.4%	6%	42.2	40.7
National Science Foundation	1,857,685.03	16.6%	14%	418,820.92	19.1%	44%	2,276,505.95	17.0%	18%	22.5	17.8
US Department of Agriculture	1,770,046.81	15.9%	19%	98,214.20	4.5%	-28%	1,868,261.01	14.0%	15%	5.5	9.2
US Department of Commerce	111,371.45	1.0%	-27%	33,861.87	1.5%	-14%	145,233.32	1.1%	-25%	30.4	25.7
US Department of Defense	38,859.09	0.3%	-84%	10,103.37	0.5%	-19%	48,962.46	0.4%	-81%	26.0	5.2
US Department of Education	102,285.56	0.9%	-25%	-	0.0%	0%	102,285.56	0.8%	-25%	-	-
US Department of Energy	932,011.21	8.4%	21%	385,156.93	17.5%	28%	1,317,168.14	9.9%	23%	41.3	39.2
US Department of the Interior	219,035.61	2.0%	1%	39,875.11	1.8%	7%	258,910.72	1.9%	2%	18.2	17.2
US Environmental Protection Agency	260,572.69	2.3%	-68%	3,935.05	0.2%	-96%	264,507.74	2.0%	-71%	1.5	11.5
US Small Business Administration	81.60	0.0%	100%	21.22	0.0%	100%	102.82	0.0%	100%	26.0	-
Other Federal	128,338.63	1.2%	40%	4,824.58	0.2%	30%	133,163.21	1.0%	40%	3.8	4.1
Total Federal	5,644,661.84	50.6%	-2%	1,089,595.89	49.6%	9%	6,734,257.73	50.4%	-1%	19.3	17.4
FEDERAL THROUGH NONFEDERAL											
Business and Industry	36,504.48	0.3%	-37%	4,563.06	0.2%	-37%	41,067.54	0.3%	-37%	12.5	12.5
Colleges and Universities	869,397.10	7.8%	5%	190,714.28	8.7%	-8%	1,060,111.38	7.9%	3%	21.9	25.1
Foundations	26,860.33	0.2%	-31%	-	0.0%	0%	26,860.33	0.2%	-31%	-	-
Local	60,968.91	0.5%	1030%	12,382.04	0.6%	793%	73,350.95	0.5%	982%	20.3	25.7
NYS Department of Environmental Conservation	446,780.92	4.0%	-11%	74,903.85	3.4%	2%	521,684.77	3.9%	-9%	16.8	14.7
Private Other	323,978.54	2.9%	-5%	48,242.38	2.2%	-7%	372,220.92	2.8%	-5%	14.9	15.3
Professional Business Associations	13,203.59	0.1%	-47%	955.17	0.0%	100%	14,158.76	0.1%	-43%	7.2	-
States Other than NYS	6,639.87	0.1%	100%	1,287.09	0.1%	100%	7,926.96	0.1%	100%	19.4	-
Other Nonfederal											
Total Federal through Other	1,784,333.74	16.0%	0%	333,047.87	15.2%	-2%	2,117,381.61	15.9%	-1%	18.7	19.0
NONFEDERAL											
Business and Industry	782,140.13	7.0%	-51%	245,958.81	11.2%	-23%	1,028,098.94	7.7%	-46%	31.4	20.0
Colleges and Universities	181,770.30	1.6%	-21%	4,501.22	0.2%	-79%	186,271.52	1.4%	-26%	2.5	9.3
Foreign	57,263.43	0.5%	2266%	11,332.86	0.5%	177%	68,596.29	0.5%	4651%	19.8	(154.6)
Foundations	470,756.11	4.2%	24%	88,600.38	4.0%	85%	559,356.49	4.2%	31%	18.8	12.7
Local	149,841.87	1.3%	-42%	30,263.19	1.4%	-11%	180,105.06	1.3%	-38%	20.2	13.3
Multiple	259,253.04	2.3%	3%	69,943.56	3.2%	-10%	329,196.60	2.5%	0%	27.0	31.1
NYS Authorities and Public Benefit Corporations	374,356.95	3.4%	-7%	134,919.11	6.1%	-11%	509,276.06	3.8%	-8%	36.0	37.7
NYS Department of Environmental Conservation	792,636.02	7.1%	-16%	124,275.56	5.7%	-14%	916,911.58	6.9%	-16%	15.7	15.2
NYS Education Department	77,617.79	0.7%	-5%	5,757.99	0.3%	-4%	83,375.78	0.6%	-5%	7.4	7.4
NYS Science and Technology Foundation	93,503.10	0.8%	1%	9,645.50	0.4%	39%	103,148.60	0.8%	4%	10.3	7.5
Other NYS Agencies	11,997.09	0.1%	-73%	1,883.32	0.1%	-63%	13,880.41	0.1%	-72%	15.7	11.8
Private Other	376,354.33	3.4%	15%	47,552.24	2.2%	50%	423,906.57	3.2%	18%	12.6	9.7
Professional Business Associations	(35,812.34)	-0.3%	-401%	-	0.0%	0%	(35,812.34)	-0.3%	-401%	-	-
Public Government Other	-	0.0%	-100%	-	0.0%	-100%	-	0.0%	-100%	-	59.0
SUNY and SUNY Related Organizations	132,450.76	1.2%	-29%	-	0.0%	-100%	132,450.76	1.0%	-32%	-	3.4
States Other than NYS	5,394.90	0.0%	-81%	-	0.0%	-100%	5,394.90	0.0%	-81%	-	0.3
Unrestricted Program Income	201.92	0.0%	-97%	44.42	0.0%	-97%	246.34	0.0%	-97%	22.0	22.0
Other Nonfederal											
Total Nonfederal	3,729,725.40	33.4%	-23%	774,678.16	35.3%	-10%	4,504,403.56	33.7%	-21%	20.8	17.7
Total Sponsored Activity	11,158,720.98	100%	-10%	2,197,321.92	100%	0%	13,356,042.90	100%	-9%	19.7	17.8
Indirect Cost Revenue (RF-Funded)	2,722,758.05			-			2,722,758.05			0.0	
Agency (Campus Foundation Administration)	485,901.61			13,079.63			498,981.24			2.7	
Royalty and Intellectual Property Licensing	8,573.40			-			8,573.40			0.0	
Technical Services and Other Non-Sponsored Activities	319,812.58			42,223.33			362,035.91			13.2	
Total Research Foundation Activity	14,695,766.62			2,252,624.88			16,948,391.50			15.3	

Summary Financial Plan • Research Foundation Research and Administrative Support
Fiscal Year 2011-12

Revenue	FY2011-12
Sponsored Program Indirect Costs and Administrative Fees	2,100,000
Non-Sponsored Program Indirect Costs and Administrative Fees	50,000
Agency Service Fees	14,000
Investment Income - *No investment income allocation planned FY2010-11	0
Royalty/License Fees	10,000
RF Regionalization Allocation	46,721
Research Support Services Fund	15,000
Mcintire-Stennis Program Administrative Authorization	61,076
NSRC Program Administrative Authorization	14,601
New York State Appropriations	3,000
Total Revenue from Sponsored Programs	**2,314,398**
Budget	
Administrative Costs	
RF Central Administration	
SubTotal RF Central Administration	**553,497**
Sponsored Programs Administration	
Research Office Salaries & Fringe	632,157
ORP Office Operations	18,950
Technology Transfer	90,000
Research Support Services	4,750
Research Program Compliance, Internal Controls & Systems	20,100
ORP Special Projects	28,748
Business Office Salaries & Fringe	208,942
Human Resources Office Salaries & Fringe	169,844
SubTotal Sponsored Programs Administration	**1,173,490**
General Services	
Mail/Receiving Salaries & Fringe	102,521
Library Salaries & Fringe	50,316
Research Development Support	53,770
SubTotal General Services	**206,608**

Financial Plan

Direct Program Support	
Outreach Salaries & Fringe	68,352
Chair Research Incentive	83,600
Individual Faculty Research Incentive	49,500
Matching/Startup	145,000
ORP Support for Individual Faculty & Research Team Support	8,200
ORP Support for Creativity, Synergy & Stimulation	23,902
ESF Seed Grants Program	36,000
ESF Travel Grants Program	0
ESF Undergraduate Research Grants Program	0
ESF Memberships & Conference Sponsorship Program	14,750
ORP Exemplary Research Award	6,000
WIS Seminar Series (transfer to State FY10-11)	0
IFR Offset Support	20,500
Backstopping Losses	75,000
Subtotal Direct Program Support	530,803
Total Budget	**2,464,398**
Major Budget Add-ons	
Contingency/(Reserve-funded)	**(150,000)**

Research Foundation Expenditures
Fiscal Year 2010-11
Expenditures by Department

Department	Direct	% Direct	Indirect	% Indirect	Total	% Total	IDC:DC
Environmental & Forest Biology	3,779,703.16	33.9%	697,240.16	31.7%	4,476,943.32	33.5%	18.4%
Adirondack Ecological Center	354,316.01	3.2%	55,495.01	2.5%	409,811.02	3.1%	15.7%
Chemistry	1,798,562.26	16.1%	465,108.15	21.2%	2,263,670.40	16.9%	25.9%
Environmental Studies	73,656.24	0.7%	20,186.06	0.9%	93,842.30	0.7%	27.4%
Landscape Architecture	321,875.53	2.9%	36,531.88	1.7%	358,407.41	2.7%	11.3%
Environmental Resources Engineering	723,019.45	6.5%	97,351.26	4.4%	820,370.71	6.1%	13.5%
Paper & Bioprocess Engineering	839,336.91	7.5%	306,591.14	14.0%	1,145,928.05	8.6%	36.5%
Sustainable Construction Management & Engineering	13,484.91	0.1%	3,167.89	0.1%	16,652.80	0.1%	23.5%
Forest & Natural Resources Management	2,374,058.99	21.3%	445,182.12	20.3%	2,819,241.12	21.1%	18.8%
AEC Projects dual-reported in EFB & AEC	(281,019.35)	-2.5%	(35,970.03)	-1.6%	(316,989.38)	-2.4%	12.8%
AEC Projects dual-reported in FNRM & AEC	(73,296.66)	-0.7%	(19,524.98)	-0.9%	(92,821.64)	-0.7%	26.6%
Subtotal - Academic Departments	**9,923,697.46**	**88.9%**	**2,071,358.67**	**94.3%**	**11,995,056.13**	**89.8%**	**20.9%**
Academic Affairs - Provost	5,608.03	0.1%	3,028.33	0.1%	8,636.36	0.1%	54.0%
Research Programs	418,212.68	3.7%	5,574.42	0.3%	423,787.10	3.2%	1.3%
Instruction & Graduate Programs	66,799.25	0.6%	0.00	0.0%	66,799.25	0.5%	0.0%
Outreach	517,436.16	4.6%	87,916.92	4.0%	605,353.08	4.5%	17.0%
Library	5,643.00	0.1%	0.00	0.0%	5,643.00	0.0%	0.0%
Student Affairs	85,429.53	0.8%	3,838.66	0.2%	89,268.19	0.7%	4.5%
Presidents Office	37,290.56	0.3%	3,454.00	0.2%	40,744.56	0.3%	9.3%
Administration & Planning	98,604.30	0.9%	22,150.92	1.0%	120,755.22	0.9%	22.5%
Subtotal - Non-Academic Departments	**1,235,023.52**	**11.1%**	**125,963.25**	**5.7%**	**1,360,986.77**	**10.2%**	**10.2%**
Sponsored Program Expenses	**11,158,720.98**	**100.0%**	**2,197,321.92**	**100.0%**	**13,356,042.90**	**100.0%**	**19.7%**
Indirect Cost Revenue (RF-Funded)	2,722,758.05		0.00		2,722,758.05		
Agency (Campus Foundation Administration)	485,901.61		13,079.63		498,981.24		
Royalty and Intellectual Property Licensing	8,573.40		0.00		8,573.40		
Technical Services and Other Non-Sponsored Activities	319,812.58		42,223.33		362,035.91		
Total Expenditures - RF Accounts	**14,695,766.62**		**2,252,624.88**		**16,948,391.50**		

Appendix 6. SUNY-ESF Administrative Unit Sustainability Practices

Research Programs

(N. Ringler)

2010-11

- Travel to meetings reduced greatly by webinars
- Reduced paper use
- Electricity – reduced use of lights, fans, electrical equipment
- Stimulate funding on sustainability-related research; 47 projects proposed ($23,704,101); 30 projects funded

2011-12

- Promote Center Symposia to be held closer to campus (e.g., Biotechnology Retreat Beaver Lake vs. AEC; ESF Centers symposium held locally)
- Promote centers/institutes joining together for mtgs., events
- Assist financially and logistically with ecological/sustainability speakers, e.g., Dr. Jeremy Jackson
- Selective printing of email messages
- Research Times, our primary opportunity outlet, available only as e-version
- Further employ electronic meeting tools: Skype, webinars, conference calls

Student Life

(C. Sedgwick 2010) (A. Lombard 2011)

2010-11

Community Engagement Programs

- Campus Day of Service – projects planned at organizations that focus around the environment; i.e., Baltimore Woods Nature Center, Syracuse City Parks, Onondaga County Parks
- Saturday of Service – occurs during freshman orientation; approximately 330 students visit 9 total parks to perform clean-up and maintenance projects
- First Year Service Projects – freshmen required to participate in at least one service project during t heir first semester; i.e., Beaver Lake Nature Center's "Enchanted Beaver Lake" festival, tree planting with Syracuse City Parks and Cornell Cooperative Extension's CommuniTree Stewards, Selkirk Shores Invasive Species Removal
- Community Engagement Fair – over 50 organizations are invited to campus to speak to students about service opportunities to help students learn about multiple ways to become involved in the community

Service Learning

- Examples of courses that incorporate service-learning into curriculum: Tropical Ecology course (EFB/FOR 523) taught by Don Stewart and Allan Drew; Ecotourism and Nature Tourism (FOR 476/676) taught by Dian Kuehn; General Chemistry (FCH 152) taught by Kelley Donaghy

Career Services

- Environmental Career Fair
- Transition of career resources to web-based platforms including the GreenLink CSM, career advising and search materials, directories, etc.

Student Activities

- "Bring your Mug" campaign
- Marshall Snack Bar moved from paper products to dishes thanks to student initiatives
- Green Campus Initiative
- Student Environmental Education Coalition
- Lights Off Campaign
- Earth Week program
- Zero Waste Campaign – initiated by GCI to cut down and eventually eliminate all waste at events on campus
- Habitat for Humanity
- Green Construction Group
- Blood Drive – four are held each year w/the intention of "recycling life"
- Ten Tons of Love – campaign in coordination with the Office of Off-Campus Programs in taking in discarded furniture, clothes etc. that students leave behind after they depart for summer vacation

Learning Community Freshman Retreat

- Hold retreat closer to Syracuse
- Freshman reading themed sustainability
- Food for event (~300 participants) made using food that was locally grown and produced in the Syracuse area

General Biology course freshman take – overview of biodiversity; various topics that contribute to sustainability

Multicultural Affairs

- Heifer Fundraising Auction – event to raise money to contribute to Heifer International which provides to help the world's poor
- Aids Memorial Quilt
- Lunchtime Learning Seminars focusing on sustainability

Reducing paper in office and producing more web-based programs

Human Resources

(M. Barber)

2010-11

- Reduce use of paper – network – send payroll all of forms for payroll; email forms to Chairs; RF appt. process needs help in obtaining use of electronic signature authority – process very cumbersome
- Cc on letters – send cc's via email
- Phone book – reduce no. of copies – suggest available on-line
- Follow Up Employee Orientation – review policies and procedures; add sustainability to orientation
- Training opportunities – sustainability; employee awareness of sustainability
- Online application system for applicants and search committees

2011-12

Reduce use of paper – network – send payroll all of forms for payroll; email forms to Chairs; RF appt. process needs help in obtaining use of electronic signature authority – process very cumbersome

- Payroll forms are now transmitted through ESF protected network for both State and RF payrolls; Chairs appoint Visiting Instructors and State GA's through online form (Provost Ofc. Initiative); HR office will continue to pursue RF electronic signatures, with possible assistance from higher-level admin.

Cc on letters – send cc's via email

- HR determined that first an analysis of required cc's was needed, resulting in greatly reducing the number of cc's on appointment letters (e.g., eliminating multiple supervisor copies, certain VP copies, etc.) In the next year, HR will ask CNS to assist with secure Unit Head files for cc's electronic transmission (same as payroll process)

Phone book – reduce no. of copies – suggest available on-line

- Phone book was not printed but same format was made available online. In 2011-12, HR will reformat current online telephone directory to a more user-friendly version, including sort capability and ESF phone numbers at-a-glance; in addition, HR will communicate more widely the search capability of the online hook-up system created by Information Systems

Follow Up Employee Orientation – review policies and procedures; add sustainability to orientation

- Follow-up Employee orientation was implemented by HR office (HR training on Workplace Violence and Sexual Harassment) and includes a segment on Sustainability by the Director of Renewable Energy; also includes participation from Business Affairs, CNS, EH&S, and University Police. Two sessions were held in Spring 2011, and one is scheduled for Fall 2011. Sessions will now be an ongoing, 2-3 times per year depending on number of new employees

Training opportunities – sustainability; employee awareness of sustainability

- HR and Renewable Energy are planning a training series for 2011-12 on Sustainability, including other Units' participation as appropriate

Online application system for applicants and search committees

- New online application system has been implemented and going live August 2011, with greatly improved capabilities, such as secure online search committee and candidate communication systems, applicant screening tools, and online recruitment approval

Government Relations and Institutional Planning

(M. Fellows)

2010-11

Looked at through STARS framework

Existing actions

- Cat. 1: Education & Research (ER)
  - ☐ Recruit and help facilitate community and government speakers and programs to the campus to provide programs related to sustainability
    - ◆ NYS Environmental Facilities Corporation – Energy Management and Funding Sources at Water Infrastructure Facilities – Oct. 6th
- Cat. 2: Operations (OP)
  - ☐ Adhere to 10/30/08 campus temperature policy
  - ☐ Sponsor Sustainable meetings and events
    - ◆ No waste meals
    - ◆ Recyclable dining products used
    - ◆ Local foods used
    - ◆ No plastic water bottles
  - ☐ Adhere to campus policies on computer purchasing and office paper purchasing
  - ☐ Recycle paper, glass, aluminum and electronic waste appropriately
  - ☐ Carpool during community and to off campus meetings

- ☐ Limit air travel – book direct flights
- ☐ Purchased more fuel efficient car for commuting

• Cat. 3: Planning, Admin. Engagement (PAE)

- ☐ Assist with campus strategic planning
- ☐ Assist with Middle States Reaccreditation with focus on sustainability
- ☐ Help secure federal and state funding for campus sustainability research and programs
- ☐ Help coordinate sustainability events and activities w/faculty, staff and students with community and government groups and officials
  - ◆ Limestone Creek Earth Day clean up with Senator Valesky's office
  - ◆ Local food initiatives with Assemblyman Stripe

2011-12

Future Sustainability Actions

• Cat. 1: Education & Research (ER)

- ☐ Better plan year round community and government sustainability speakers and programs around themes or targeted issues. Engage students

Cat. 2: Operations (OP)

- ☐ Assist in writing campus policy regarding Sustainable meetings practices
- ☐ Keep track of carbon usage for 1 year using agreed upon carbon calculator or other methodology
  - ◆ Opportunities for reduction in transportation, electricity (refrigerator) use etc.

Cat 3: Planning, Admin. & Engagement (PAE)

- ☐ Help secure federal and state funding for campus sustainability research and programs
- ☐ Work with President and others on campus to comment regularly on state and federal sustain ability issues
- ☐ Help coordinate Campus Local Food efforts
- ☐ Help track faculty and staff community service focused on sustainability
- ☐ Help the college have a greater profile in American College & University Presidents' Climate commitment
- ☐ Serve on the Central New York/Mohawk Valley Region Project Advisory Committee for the Mohawk-Erie Multimodal Transportation Corridor Plan with an emphasis on sustainability
  - ◆ Help create a master plan for the Mohawk-Erie Corridor, one of NYS critical trade corridors that supports a variety of economic needs for adjacent communities by moving commuters, employees, tourists, raw materials, and finished goods
- ☐ More effectively use the ESF Government Relations Website
  - ◆ Post and track state and federal sustainability issues and legislation
  - ◆ Post provocative articles regarding sustainability

    Dr. John Holdren's recent suggestion "rebranding" global warming to "global climate disruption"

Communication's Office

(C. Dunn)

2010-11

- Printing less; no more mailing press releases; email predominately
- Learning to edit on screen instead of printing – 1st or 2nd editing mainly
- Send extra copies to daycare centers so as not to waste

- No longer print College catalog
- Inside ESF – being offered to read online and not print; option available and will continue to offer
- Video projects done on memory cards
- Piggy backing large printing jobs so as not to waste resources
- Reduced use of lighting, heat, air conditioning
- Use interchangeable displays to cut down on costs of printing
- Carpool to off campus meetings
- Bring your own mugs and have own composting operation
- Invitations and newsletters electronically to save paper and costs

Undergraduate Admissions

(S. Sanford)

2010-11

- Educate prospective students on College's mission
- Scholarship programs toward attracting and retaining students from underprivileged backgrounds
- Collaborate with other colleges online via web; cut down on travel
- Reduce use of paper and print materials – students expect online/internet materials; social networking, etc.
- Maximizing utilization of paperless workplace – Common Apps and SUNY Apps Service Center converted to paperless products – need to get students and parents to use system
- On campus and off campus recruitment activities – cut down on travel and piggyback travel
- Use hybrid vehicles while traveling/recruiting
- Consolidating campus activities
- Composting; paper to GCI; catering - utilize recycled materials

Development/ College Foundation

(B. Greenfield)

2010-11

Operations areas

- Development of student residence – sustainable design practice – Silver LEED building hoping for Gold status
- Management of facility
- Charging stations for electric vehicles
- Indoor bike storage
- Management practices for building
  - Green cleaners, recycling containers, educate students, etc.
  - Furniture hardwood
- Investments for Foundation 1% is designated in socially responsible fund
- Forest properties – Sustainable Management Plan; develop easements for forever wild properties;
- Large no. of events use electronic invites
- Recycling products
- Feinstone – serve local/seasonal food, purchasing from local vendors

Office management – electronic file storage conversion; better use of software; Annual Fund callers – feed dinner – purchased reusable bottles, plates and silverware;

Stationary recycle content

Travel – minimize air transportation

Increasing no. of electronic solicitations; push for online giving; electronic communications with donors; Honor Roll of Donors – cut production of hard copy

Near term – move forward on forested properties – tree farm certification; make Centennial Hall more sustainable by looking for funding for solar array panel on roof – private fundraising

Centennial Campaign – endowed chairs in sustainability.; endowed climate change; new curriculum in climate change

Printing – envelopes – need to find recycled content

2011-12

Centennial Hall

- Sustainable design and construction – applying for Gold LEED status
- Charging station for electric vehicles
- Indoor bike storage
- Green cleaners, recycling containers, planned student education programs on energy reduction, recycling and composting
- Hardwood Furniture

Other Foundation Assets

- 1% of invested assets are designated in socially responsible fund
- Sustainable Management Plans for timber properties
- Development easements for forever wild properties
- Office Management
- Increasing number of events use electronic invites
- Follow college guidelines for recycled content stationary
- Increasing number of electronic solicitations; push for online
- Reducing production of hard copy publications such as Honor Roll
- Electronic file storage conversion; better use of software

Events

- Striving to serve local/seasonal food at events with post-event composting
- Purchased reusable bottles for Annual Fund callers

Travel

- Minimize air transportation
- Clustering trips to visit maximum number of donors

Centennial Campaign

- Soliciting for endowed chairs in sustainability and climate change
- Advancing proposals for sustainability related centers & programs

Business Affairs

(M. Fennessy 2010)
D. Dzwonkowski 2011)

2010-11

- Reducing paper usage – copier printer paper is 100% recyclable; (large high speed copier in copy center uses 30% recycled content – cannot accommodate 100%)
- Sustainable purchasing – work with Physical Plant in acquiring cleaning products; pesticides; acquiring energy efficient and hybrid vehicles for the fleet
- Personal efforts – wear sweaters in cooler temperatures; windows open and fans on in summer; dress accordingly; ride bike as much as possible; work with IT to acquire Energy Star products for computers

2010-11

- Turn lights off when away; turn off office equipment when leaving for the day; and trying to be paper-less when possible (i.e., scanning documents and storing them in shared folders instead of everyone making their own hard copy)
- New Sustainable Materials and Supplies Purchasing Policy will be supported and monitored by the Business Office
- Online billing

Alumni Affairs

(J. Culkowski)

2010-11

- Important to reuse
- GCI – met with; trying to use 100% recycled for Fall and Family BBQ
- Off campus events – encourage carpooling for staff and students
- E-news replaced hard copy versions (only do 2 hard copies per year)
- Trees are renewable – we shouldn't lose sight of that
- Reusable glasses and goblets – Champagne toast; Thanksgiving toast, etc.
- Alumni events – reuse name tag holders
- Shades and fans
- Golf tournament – used beer kegs instead of cans
- Recycle computers and furniture on campus
- Reuse name badges

Information Technology

(Y. Tung)

2010-11

- Technology to contribute to sustainability
- Reduce, reuse, recycle
- Reduce paper usage in computer labs w/print quota (cut by 50% in 2 year's time)
- Encourage 100% new tech equipment needs to be Energy Star certified
- Reuse equipment

- Recycle – work with Physical Plant closely; do not throw computers in trash, see if it can be deployed elsewhere
- Try to use automatic shut down features on equipment to conserve bulbs and electricity

2011-12

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- Encourage 100% new tech equipment needs to be Energy Star certified
- Reuse equipment
- Recycle – work with Physical Plant closely; do not throw computers in trash, see if it can be deployed elsewhere
- Try to use automatic shut down features on equipment to conserve bulbs and electricity
- Campus-wide programs to reduce and minimize energy consumption of desktop computing technology
- Submetering of power for IT data centers (to have a sense of the energy consumption level)

Outreach and Instructional Quality

(C. Spuches)

2010-11

Energy conservation efforts

- Utilizing online learning opportunities (webinars) in lieu of in-person meetings, to minimize the amount of travel to and waste from events, i.e.:
  - ☐ Advanced Solar Power As Renewable Energy
  - ☐ Leading Sustainability
- Reducing electricity use
  - ☐ Most office space does not have air conditioning
  - ☐ Use air conditioning on low or fan setting when appropriate
  - ☐ Use window for ventilation and cooling
  - ☐ Use desk light or natural light when possible
  - ☐ Turn off power strips when not in use
  - ☐ Turn off monitors and computers when not in use
  - ☐ Use of alternating office lights instead of all bulbs
  - ☐ Use stairs instead of taking the elevator
  - ☐ Working half days on Fridays in the summer
  - ☐ Utilizing office space more efficiently (5 people in a room)

Waste Cutting Efforts

- Cut down on unnecessary travel and meetings
- Reduce our use of materials (paper/toner)
  - ☐ End-of-course student surveys replaced w/online survey
  - ☐ Online survey software for program evaluation instead of paper
  - ☐ Not printing individual registration forms for ESF in the High School participants (eliminating 500+ sheets of paper each year)
  - ☐ View files and mass communications electronically instead of printing
  - ☐ PowerPoint presentations available online instead of hard copies

- ☐ Double-sided printing
- ☐ Provide simple one-page programs for events
- ☐ Use project equipment in lieu of making handouts for everyone during meetings
- ☐ Email printing and copy jobs to Copy Center instead of printing out forms
- ☐ Outreach members make an effort to drive fuel efficient vehicles

• Recycling materials
- ☐ Recycle printer ink cartridges
- ☐ Recycle catering materials as appropriate
- ☐ Provide recycling bins at off-site events

• Reusing materials
- ☐ Reuse plastic nametag holders
- ☐ Bring your own mug
- ☐ Staff member reupholstered a chair that was going to be discarded and is currently being used in the office

Purchasing from Environmentally and Socially Sustainable Sources

- Request caterers use green products within budgeted cost constraints
- Use reusable items such as linen cloths, glassware, containers, metal utensils and other items
- Order plaques made from recycled materials or Forest Stewardship Council forests

2010-11

Future Sustainability Practices

Energy Conservation Efforts

- Expand use of distance learning technologies (e.g., webinars)
- Reward those who use public transportation, carpooling to attend events
- Continue and further our energy conservation efforts

Waste Cutting Efforts

- Create a paperless registration process for all non-matriculated students and non-credit participants
- Identify the graduate student on campus who is involved in the composting project, so we can compost food materials from on-campus events
- Continue and further our waste-cutting efforts

Purchasing from Environmentally and Socially Sustainable Sources

- Purchase recycled or recyclable plates and utensils for food at meetings
- For larger meetings/conference, consider identifying a company to underwrite the added cost of recycled products in exchange for a promotion during the event

Physical Plant

(A. Ritter)

2011-12

- Use resources effectively –
- Application process – logging in info for future reference
- Hydrogen conversion kit for fleet vehicles

Provost's Office

(B. Bongarten)

VP Administration's Office

(J. Rufo)

Sustainable & Renewable Energy

(M. Kelleher)

Renewable Energy Systems

2010-11

- Implement STARS assessment
  - ☐ Completed STARS assessment in April 2011
  - ☐ Obtained Silver Rating
  - ☐ Incorporated STARS as part of Middle States Special Study
- Assist in development of energy major
  - ☐ Led the development of Sustainable Energy Management Major, will become part of FNRM when approved
- Increase use of biodiesel at ESF

  Expanded the use of biodiesel to include AEC

2011-12

- STARS rating from Silver to Gold
- Increase applications of biodiesel

Enrollment Management & Marketing

(R. French)

2010-11

- Purchase and implement Ridesharing system in partnership w/SU

2011-12

- Assess ridesharing system usage
- Promote system to new students/staff
- Add UMU to ridesharing system

Instruction & Graduate Studies

(S. Shannon)

2010-11

- Reduces paper usage by utilizing online system
- Catalog online
- Use local food vendors
- Turn off computers, printers, etc. when not in use

2011-12

- Paper use reduced significantly by moving paper-based systems to electronic systems (such as grad. application system, graduate application review, and graduate records) . More planned all the time, including admissions status & decision notification moving on-line in 2012
- Movement of ESF catalog to on-line in coordination w/ Communications Office

- Move almost all of graduate recruiting efforts to focus on website content & usability (no new paper recruiting materials, print ads)
- Materials and vendors selected for graduate orientation screened for 'sustainability' (i.e. local merchants & vendors, recycled materials as possible, local food when possible, etc.)
- Host 2nd floor "coffee-pool" using K-cup brewer to limit waste & energy usage, individuals use ceramic mugs, etc.
- Investigating on-demand thesis printing & binding services, currently using local bindery
- Minimize use of A/C in summer, set A/C units @ 78F or higher, close shades during summer mornings.
- Turn off all computers, printers, copiers, etc. overnight.
- Purchase new equipment meeting Energy-Star standards
- Reduce paper correspondence to absolute minimum (currently only admission decision letters, graduate funding letters, probation/suspension letters, Dean's list letters, recommendation letters, official letters or college support or college agreements)

Forest Properties

(R. Davis)

- Substantial reduction (>50%) in gasoline usage on southern properties has been achieved through more appropriate grounds maintenance program and substantial reduction in automobile travel
- Deliberate move toward diesel fuel in all newly acquired vehicles and equipment. It is our intent to move entirely to diesel fuel (bio-diesel wherever possible) for all but our hand-held power tools
- Use of residential and office facilities on properties for other than caretaker use has been minimized during winter months to reduce fuel usage (temperatures maintained at 55°F) – we have noted, but not yet calculated additional savings due to change in use pattern.
- Fleet management plan developed to reduce overall fleet by 5 vehicles total and more appropriately match remaining vehicles to specific tasks. Will take place as vehicles come up for replacement

Appendix 7. Student Open Forum on Sustainability and Results from Bulletin Board

The suggestions below are the results from one open forum on sustainability held during SUNY-ESF's Earth Week events on April 18, 2011, and three open-space bulletin boards posted on campus during November and December 2010 and January 2011 in Marshall Hall, Moon Library and Bray Hall.

Note: The numbers in parentheses following suggestions indicates the number of times the item was either written or agreed with on the bulletin board or during the open forum. Items that have no number following the text were only written or stated once.

Academics

Curriculum

- Post a list of available courses related to sustainability.
- All papers submitted electronically only.

Faculty

- Professors that care.
- Have faculty lead students in projects in their area of expertise on campus. Faculty need to do more! A lot more!
- SUNY-ESF has excellent student ßà faculty/staff interactions
  - ☐ Willingness
  - ☐ Transparency
  - ☐ Awareness/education

Other

- iPads for every students (electronic text books, notes, tests)
- Introduce a "green" or local daily product to the students and faculty members. Can consult story of stuff website. (2)

Operations

Bottled Water

- Remove bottled water from campus and increase number of drinking fountains.
- Remove water bottles from vending machines
  - ☐ Contracts w/vendors?
  - ☐ Talk to S.U.

Campus Garden

- ESF community organic garden. (6)
  - ☐ Response: as a credit-bearing summer course.

Compost

- Compost everything!
- Encourage people to compost more. Have compost bins in every building at every event.
- We should compost and use the compost for the community garden
- Compost system working well BUT more & bigger bins
- Students want to bring compost from home (2)
- What is the capacity of composting system? So far so good

Energy

- Rooftop wind turbines. (3)
- Conduct energy audits and hold faculty and departments responsible for things they leave on. (2)
- White roofs.
- Green roofs.
- Install more efficient windows.
- For the school power plant, use multiple means to generate our own electricity to supply for classrooms, etc. For example, use gravity and water – a device that can self-perpetuate and generate without having to burn an energy source to produce electricity. A power plant near Albany does this with two man-made lakes and turbines.
- Take away electric staplers

Food

- More organic food in the Marshall food court.
- Serve local food in the Marshall food court.
- Don't serve large corporate products like Pepsi or Coca-Cola.
- Don't use disposable cups or plates in the food court.
- Offer reusable cups in the Marshall food court.
- Don't use corn syrup.
- Give all compost to local pig farmers.
  - ☐ Response: Why not compost here?
- More sustainable food vendors in Gateway Building

Gateway Building

- Host sustainability conference once Gateway opens as a showcase for ESF
- Information/education about economic sustainability & green technology in Gateway Building

<u>Grounds</u>

- Plant trees on the Quad, and on Hendricks field. (5)
- Use less salt. (4)

  ☐ Response: Use salt so when I slip and fall I won't sue and take the money they could use to be more sustainable.
- Can we move to salt substitutes?
  - ☐ Online forum to explain why/why not
- Designate low/no mow areas to reduce sedimentation
- Vegetation analysis for runoff & sediment policies
- For a school with a great LA program, the landscaping on campus is terrible.

<u>Heating and Cooling</u>

- Please lower the thermostats in campus buildings. (5)
- Make buildings more efficient at retaining heat. (Illick is cold)

<u>IT</u>

- Default print on both sides. (15)
- Turn off computers and monitors after hours (2).
- Response: They are turned off 8pm – 6am.
- Response: No they are not.
- Rebuild IT infrastructure and bring campus up to date.

Lawn Care

- Replace plantings that require irrigation (including turf grass) with native species that don't require pesticides or fertilizers. It'll help to reduce run-off and add visual interest. (10)
- Response: Or let the grass grow.
- Stop putting chemicals on the grassed areas. (5)
- Stop mowing the Quad. (2)
- Use motorless mowers.
- Have low/no mow zones.
- Use sheep to mow the grass.
- Use goats to mow the grass. (2)
- Get no-now sedges.
- Do not replace grass with sod in the spring.
- Do not use leaf blowers on campus. Compost instead.

Lighting

- Install motion sensor lighting in restrooms (3) and studios.
- Use less lighting in buildings after 11pm.
- More windows and natural light.
- Use fewer light bulbs in the bathrooms.
- Fewer lights.
- Switch to using candles.

Paper

- Take all one sided recycled papers and put them together to make a reusable notebook.
- Email everything to save paper.

Recycling/Reuse

- More recycling bins around campus for paper and plastic.
- Free Store: have a garage or small enclosed area where students can donate used items (books, clothes furniture) for other students to take. At the end of each semester, donate the left-overs to charity. Everyone benefits without having to buy new items.
- Solid waste reduction à more transparency, updates on progress monitoring
- Lack of consistency in recycling collection efforts
- Better labeling?
- Similar types of containers

Restrooms

- Dual-flush toilets. SU has them, so we should to. (3)
- Waterless urinals.
- If it's yellow, let it mellow.
  - Response: Unless you want to be sick all the time.
  - Response: Please don't stop flushing toilets.
  - Invest in more efficient urinals and toilets.
- Install motion-sensing sinks in the bathrooms and in the new dorms.
- Response: We tried this in the ladies room and it didn't work well.
- People need to turn the water faucets off in the bathrooms after washing their hands.
- No longer use paper towels in bathrooms.

Reusable Mugs

- Dunkin Donuts doesn't let us use our own cups, even the ESF mug.
  - Response: This requires third party vendors to allow ESF cups in order to do business here.
- Stormwater Management
- More permeable walkways (2) and rain barrels.
- Install greywater systems

Transportation

- Install electric car or plug-in hybrid car charging stations from some parking spaces.
  - Response: Battery waste will be produced from hybrids, which is inefficient.
- Get rid of the shuttle van. (2)
  - Response: Someone may have a handicap and need it. (2)
  - Response: It is not needed all day – just in the a.m. and p.m. (3)
- ESF Shuttle – Who is it for? Where does it stop?
  - Initiated during construction for staff who had to park in Standart Lot
  - Shuttle hours have changed based on demand, reduce frequency
  - Shuttle will end when construction is over
  - Need to assess/minimize the environmental impact
  - No idling policy – also for buses, other university vehicles
  - Use cell phone to call shuttle when needed
- Incentivized use of public transit for employees. Many use personal vehicles which are one of the top five biggest contributors of CO_2 emissions. (2)
- More bike racks. (2)
- Group transportation for student (volunteer) events
  - Public buses?
  - Cost to student groups
- More information for students/faculty/staff about public transportation

TV Screens in Bray

- TV screen that displays sustainability information are a great idea. (2)
  - Response: No one reads them.
- Turn off the TVs. Unplug them and sell them to buy more solar panels. (3)

Vending Machines

- Stop using corporate vending machines. Get local, stay local. (2)
- The packaging of vending machine sandwiches really irks me. Boycott them.
  - Response: Disagree. $2 sandwiches are cheap.
  - Response: It's cheaper to make your own sandwiches

Other

- Feed food scraps to pigs, then eat the pigs.
- More pencil sharpeners.
- No smoking on campus.
  - Response: (crossed out)
- ESF is going a GREAT job! Keep up the current efforts. (2)

Student Outreach and Co-Curricular Activities

Co-Curricular Activities

- Incentivize student clubs to hold zero waste events. Awards?
  - Work w/GCI to get clubs to commit
- How to communicate with students?
  - Green orientation for new students à highlight ongoing activities
  - Continue with signage that highlights sustainability efforts
  - Publically posted responses to student recommendations on bulletin boards
  - More regular open forums on sustainability efforts on campus
  - Walking tour on campus for new students & also as a teaching tool
  - Make sustainability efforts clear on student club website – on student life website
- Clothing swaps for students – and other used items
- What will be the role of students in actively pursuing these goals?
- Student club posting policy – how to improve?
  - Digital signage
  - Student club websites à centralized?
  - Currently reviewing policies on where to post
  - Do clubs take down old posters?
  - Open up non-traditional posting areas (ex. Chalk on sidewalk)
  - Students are respectful of posting policies
  - Approved posters?
- Better collaboration w/physical plant & student groups (and others)

Outreach

- What is ESF doing for community outreach?
  - Open forum/meetings for green initiatives for home owners
  - Office of Outreach holds courses, workshops, conferences, etc.
  - How to communicate these efforts to students?
    - Listserv for nontraditional students
- Webinars for campus meetings/seminars
  - Some rooms in newly renovated buildings support webinar
- Outreach office seminars could provide credits for senior students
  - Certification courses

Other

- Show students we're listening – provide responses to suggestions
- Green/Sustainability Fee.
- More no-waste events (students are better at this than faculty and staff)
- Long term website to track/address sustainability efforts

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